

**TECHNICAL MANUAL**  
**OPERATOR'S MANUAL**

**MULTIPLE INTEGRATED LASER  
ENGAGEMENT SYSTEM  
(MILES 2000)**

**TACTICAL ENGAGEMENT SIMULATION SYSTEM (TESS)**  
**FOR**

**INDIVIDUAL WEAPONS SYSTEM (IWS)**  
**M16A2, M24, M40A1, M249, M2, M60, AND M240G**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS.**  
You can help improve this manual. If you find any mistakes or you know of a way to improve the procedures, please let us know. Mail your letter, DA FORM 2028 (Recommended Changes to Publications and Blank Forms), or DA FORM 2028-2 located in back of this manual directly to Commander, Simulation, Training, and Instrumentation Command (STRICOM): ATTN: AMSTI-OPS-L; 12350 Research Parkway, Orlando, FL 32826-3276. Marine Corps users submit NAVMC 10772 to: Commander, Marine Corps Logistics Base (Code 826), 814 Radford Boulevard, Albany, GA 31704-1128.

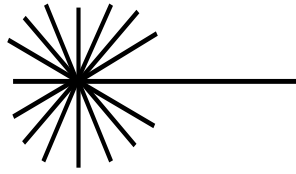
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UNITED STATES MARINE CORPS**

**27 MAY 2002**



**LASER WARNING**

Suitable precautions must be taken to avoid possible damage to the eye from overexposure to radiated laser energy. Precautionary measures include the following:

- **NEVER fire the laser** at personnel within 10 meters.
- **NEVER look at the laser transmitter** through magnifying optics such as binoculars, telescopes, or periscopes at ranges less than 40 meters.

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## **SAFETY SUMMARY**

- DO NOT load MILES-equipped weapons with live ammunition or the wrong blank ammunition. IMPROPER AMMUNITION may cause FATAL INJURIES. Refer to the associated weapons technical manual for information on the use of blank ammunition.
- Ensure the weapon has the correct blank fire adapter and it is attached to the weapon correctly. Failure to install the blank adapter when firing blank ammunition could result in serious injury or death.
- MILES equipment transit cases have a multiple personnel lifting requirement. Failure to use sufficient personnel could result in injury during installation or removal.

### **FIRE/EXPLOSION WARNING**

- Tape primer is toxic and highly flammable. Do not spray near heat, open flame, or sparks. Use primer only in well ventilated areas. Do not permit smoking in the area. Injury to personnel may result.

### **CAUTION**

- Any batteries or otherwise hazardous materials replaced as routine maintenance should be disposed of in accordance with local procedures.
- Ensure battery door/cap is securely closed during storage and operations, or damage can occur to the battery door/cap.
- Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

For information on **FIRST AID**, refer to **FM 21-11/MCRP-3-02G**.

## **HOW TO USE THIS MANUAL**

### **INTRODUCTION**

This manual contains operation instructions for the Multiple Integrated Laser Engagement System (MILES 2000), Tactical Engagement Simulation System (TESS), when configured with the Individual Weapons System (IWS).

### **MANUAL DESCRIPTION**

This manual is divided into three chapters. Chapters are further divided into sections. The chapter descriptions are provided in the following subparagraphs:

Chapter 1 is an introduction that provides general information, equipment description and data, and theory of operation.

Chapter 2 provides operating instructions.

Chapter 3 provides operator maintenance instructions.

## CHAPTER 1 INTRODUCTION

### SECTION I. GENERAL INFORMATION

#### **1.1 SCOPE.**

This manual describes how to install, operate, and maintain the Multiple Integrated Laser Engagement System (MILES 2000), Tactical Engagement Simulation System (TESS), when configured with the Individual Weapons System (IWS). The manual also explains all authorized operator maintenance. Refer any maintenance problems not covered to organizational maintenance personnel.

#### **1.2 MAINTENANCE FORMS AND RECORDS.**

Department of the Army forms and procedures used for equipment maintenance will be those described by DA PAM 738-750, The Army Maintenance Management System (TAMMS). U.S. Marine Corps (USMC) personnel will use Technical Manual (TM) 4700-15/\_\_, Equipment Record Procedures, and refer to the on-line MCPDS or USMC Stocklist SL-1-2, Index of Technical Publications.

#### **1.3 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).**

If your MILES 2000 equipment for the Individual Weapons System (IWS) needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on a Quality Deficiency Report. Mail to us at Commander, Simulation, Training, and Instrumentation Command (STRICOM), ATTN: AMSTI-OPS-L; 12350 Research Parkway, Orlando, FL 32826-3276. We'll send you a reply. For USMC personnel, submit SF-368 in accordance with MCO 4855.10 (Quality Deficiency Report) to: Commander, Marine Corps Logistics Base (Code G316-1), 814 Radford Boulevard, Albany, GA 31704-1128.

#### **1.4 CORROSION PREVENTION AND CONTROL.**

- a. Corrosion Prevention and Control (CPC) of Army material is a continuing concern. It is important that any corrosion problems with this item be reported so the problem can be corrected and improvements can be made to prevent the problem in the future.
- b. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling or breaking of these materials may be a corrosion problem.
- c. If a corrosion problem is identified, it can be reported using form SF-368. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will assure the information is identified as a CPC problem.
- d. The form should be submitted Commander, Simulation, Training, and Instrumentation Command (STRICOM), ATTN: AMSTI-OPS-L; 12350 Research Parkway, Orlando, FL 32826-3276. USMC personnel, submit SF-368 in accordance with MCO 4855.10 (Quality Deficiency Report).

## **1.5 PREPARATION FOR STORAGE OR SHIPMENT.**

When receiving equipment for storage or shipment, always inspect the returned equipment for damage, breaks, cracks, and cleanliness.

## **1.6 LIST OF ABBREVIATIONS AND GLOSSARY.**

Refer to Table 1-1 for the list of abbreviations used with the MILES 2000 System and to Table 1-2 for the glossary.

**Table 1-1. List of Abbreviations.**

AAV	Assault Amphibious Vehicle
AC-DC	Alternating Current/Direct Current
ASAAF	Automatic Small Arms Alignment Fixture
ATWESS	Anti-Tank Weapons Effects Signature Simulator
AVCPS	Audio Visual Cue Pyrotechnic Simulator
BFA	Blank Firing Adapter
BIT	Built-In-Test
CD/TDTD (Controller Gun)	Controller Device/Training Data Transfer Device
CDA	Control Display Assembly
CPC	Corrosion Prevention and Control
CSWS	Crew Served Weapon System
CU	Control Unit
CVC	Combat Vehicle Crew
CVS	Combat Vehicle System
DC-DC	Direct Current/Direct Current
DPCU	Data Processing Control Unit
EIR	Equipment Improvement Recommendation
EOD	Explosive Ordnance Disposal
FCU	Fire Control Unit
FlashWESS	Flash Weapons Effects Signature Simulator
FU	Firing Unit
ID	Identification
I/O	Input/Output
IR	Infrared
ISU	Integrated Sight Unit
ITS	Independent Target System
IWS	Individual Weapons System
IWS Console (DPCU)	Individual Weapons System Console (Data Processing Control Unit)

**Table 1-1. List of Abbreviations – Continued.**

KSI	Kill Status Indicator
LAV	Light Armored Vehicle
LASER	Light Amplification by Simulated Emission of Radiation
LED	Light Emitting Diode
LTU	Laser Transmitter Unit
LU	Loader Unit
MARS	MILES After-Action Review System
MCS	Master Control Station
MG	Machine Gun
MGS	Missile Guidance System
MGSS	Main Gun Signature Simulator
MILES	Multiple Integrated Laser Engagement System
OTPD	Optical Turret Positioning Device
PID	Player Identification
Pk	Probability of Kill
PMCS	Preventive Maintenance Checks and Services
PN	Part Number
PROM	Programmable Read-Only Memory
SAT	Small Arms Transmitter
SMAW	Shoulder-Mounted Assault Weapon
SWS	Surrogate Weapons System
TAMMS	The Army Maintenance Management System
TESS	Tactical Engagement Simulation System
TM	Technical Manual
TNB	Turret Network Box
ULT	Universal Laser Transmitter
USMC	U.S. Marine Corps
V	Volt
Vac	Volts Alternating Current
Vdc	Volts Direct Current

**Table 1-2. Glossary.**

Administrative Kill	A kill initiated by the CD/TDTD (Controller Gun) for administrative purposes.
Automatic Small Arms Alignment Fixture (ASAAF)	Device used to align the Small Arms Transmitter (SAT) to the sights on a weapon.
Catastrophic Kill	A kill that totally disables a vehicle or individual.
Cheat Kill	A kill is assessed to a system when a tamper attempt has been detected.
Commo Kill	A kill that disables external communications.
Controller	An umpire or referee in a MILES 2000 training exercise.
Controller Device (CD/TDTD) (Controller Gun)	A device used by the Controller to upload, download and test the MILES 2000 system.
Fastener Tape	A hook and pile type tape used to hold vehicle detector belts and other MILES 2000 equipment in place.
Firepower Kill	A kill that disables vehicle weapons.
Helmet Harness	The part of the IWS attached to the helmet or soft cover.
Hit	Simulated contact with incoming fire that does not result in a Kill.
Individual Weapons System (IWS)	The Helmet and Torso Harness assemblies and IWS Console (DPCU), which is worn by personnel. This equipment also includes the Small Arms Transmitter (SAT).
Kill	Refer to Catastrophic Kill, Commo Kill, Firepower Kill, or Mobility Kill
Kill Status Indicator (KSI)	A device attached to a vehicle that produces an external flashing light indicating a Hit, Near Miss or Kill.
LASER	Light Amplification by Simulated Emission of Radiation. A narrow beam of light capable of transmitting information.
Laser Beam	In MILES 2000 equipment, an eye-safe, invisible beam of light that simulates weapons fire.
Laser Detector	A device that senses incoming laser beams.
Laser Transmitter	A device that transmits a laser beam.
Main Gun Signature Simulator (MGSS)	A device that produces a flash and bang to simulate main gun firing.
Mobility Kill	A kill that disables the vehicle movement. The crew has 20 seconds to bring the vehicle to a stop. If motion is sensed after the 20 seconds, a Cheat Kill will occur.
Near Miss	Laser fire close enough to be sensed by a laser detector, but not close enough to cause a Hit or Kill.

**Table 1-2. Glossary – Continued.**

Optical Turret Positioning Device (OTPD)	A device that provides an optical reference signal to the turret detector belts (on applicable vehicles) to determine the turret position with reference to the hull
Reset	Brings the system to the ready (alive) condition. In a Combat Vehicle System (CVS), the reset brings the system to a ready condition and returns ammunition to the default levels.
Resurrect	When a CVS is resurrected, the system is brought to a ready condition, but the ammunition levels remain as they were when the system was killed.
Small Arms Transmitter (SAT)	A laser transmitter used on various individual and vehicle-mounted rifles and machine guns.
Torso Harness	The part of the IWS that is worn on the upper body.
Universal Laser Transmitter (ULT)	A laser transmitter used on various combat vehicle systems mounted on the main gun and the coax machine gun.
Weapon Token	Is embedded in software and allows the IWS Console (DPCU) to enable a SAT. The Weapon Token is transmitted to the IWS when the system is reset/resurrected by the CD/TDTD (Controller Gun). The SAT cannot be enabled without a Weapon Token and will not have one in the following conditions: system is killed or another SAT is enabled with the same Torso Harness.

**NOTE**

Vehicle kits contain the SATs for the vehicle mounted weapons, but do not include IWS SATs.

**1.7 SAFETY, CARE, AND HANDLING.**

Before, during and after operation of equipment, read and adhere to all applicable WARNINGS and CAUTIONS. Perform all preventive maintenance checks and services as scheduled, and report any discrepancies as soon as possible. Use the proper tools and procedures for installation, troubleshooting, removal and replacement of components, and notify higher echelon maintenance personnel when warranted.

Although MILES 2000 consists of ruggedized equipment, designed to withstand extreme vibration, shock, and environmental stresses, treat the equipment with reasonable care. Do not use excessive force when handling, packing, or stowing equipment. Responsible handling and use will help prolong the life cycle and appearance of the equipment.

## SECTION II. EQUIPMENT DESCRIPTION AND DATA

### **1.8 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.**

**1.8.1 Equipment Characteristics.** The MILES 2000 Individual Weapons System (IWS) permits the individual soldier to take part in realistic combat training exercises. Actual firing conditions of all weapons are simulated using laser beams. Blank ammunition adds to the system's realism.

Laser detectors, worn by soldiers, sense incoming fire. The MILES 2000 system electronics determine the accuracy and simulated damage of incoming fire. The system also detects the type of weapon directing fire against the soldier.

### **1.8.2 Capabilities and Features.**

- a. Easily installed and removed.
- b. Simulates firing capabilities and range of individual weapons.
- c. Blank-fire adds realism.
- d. Normal firing procedures used for all weapons.
- e. Detects all incoming fire, identifies incoming weapons and player identification (PID), and determines the effect of incoming fire on the individual.
- f. Uses eye-safe laser transmitters.
- g. Audio signals indicate Near Miss or Kill.
- h. Compatible with all other MILES devices.

### **1.9 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.**

The MILES 2000 Individual Weapons System (IWS) contains the following equipment:

#### **1.9.1 Individual Weapons System.**

- a. IWS. The manworn portion of the IWS consists of a Torso Harness with IWS Console Data Processing Control Unit (DPCU), a Helmet Harness, and fastener tape or safety pins which are used to secure the Helmet Harness. The harness set has the following:
  - (1) Detectors – receive coded messages from laser transmitters.
  - (2) Amplifier – amplifies coded messages received from incoming laser transmitters and forwards them to the IWS Console (DPCU) for decoding.
  - (3) Infrared (IR) Transmitter – transmits information which links the Torso Harness and the weapon's Small Arms Transmitter (SAT).
  - (4) Audio Alarm – indicates the laser signal received.



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- (5) Helmet Inductive Loop – transfers information from the Helmet Harness detectors to the Torso Harness IWS Console (DPCU) for processing. The Helmet Harness Amplifier is powered by an internal 3.6-volt lithium battery with a 3-year battery life.
- (6) IWS Console (DPCU) – Data Processing Control Unit for the IWS – provides user interface and decodes the laser and IR transmitted data for the IWS.
  - (a) IWS PN 147421 is powered by a 9-volt battery with approximately 72 hours battery life.
  - (b) IWS PN 148245 is powered by an internal 3.6-volt lithium battery with approximately a 12-month battery life.
- b. Small Arms Transmitter (SAT). Adaptation for the specific weapon is through a factory set laser and attaching the weapon specific mounting adapter. The laser power is factory adjusted to represent the specific weapon type and simulate its firing capabilities. The SAT is powered by an internal 3.6-volt lithium battery with a 3-year battery life. The SAT must be properly installed on a weapon and aligned using an Automatic Small Arms Alignment Fixture (ASAAF) to ensure the weapon's accuracy.

**1.10 EQUIPMENT DATA.**

Table 1-3 defines the Equipment Data.

**Table 1-3. Equipment Data.**

<b>SAT/ADAPTERS</b>	<b>STANDARD KILL RANGE (METERS)</b>
M16A2 (ARMY, USMC)	10-550
M240 Machine Gun (ARMY)	10-1100
M240 Machine Gun (USMC)	10-1800
M2 Machine Gun (ARMY)	10-1800
M2 Machine Gun (USMC)	10-1800
M24/40 (ARMY/USMC)	10-1000
M249 (ARMY)	10-800
M60 Machine Gun (ARMY)	10-1100
M60 Machine Gun (USMC)	10-1800

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Table 1-4 defines the Equipment Characteristics for the IWS System (general).

**Table 1-4. Equipment Characteristics.**

<b>EQUIPMENT</b>	<b>WEIGHT (POUNDS)</b>	<b>DIMENSIONS L x W x D (INCHES)</b>	<b>NUMBER OF DETECTORS</b>
IWS Helmet Harness	0.9	7.6 x 3.4 x 1.7	4
IWS Torso Harness (PN 147421)	3.3	24.0 x 7.6 x 1.7	8
IWS Torso Harness (PN 148245)	3.3	24.0 x 7.6 x 1.7	8
Small Arms Transmitter (SAT)	1.0		N/A

## SECTION III. THEORY OF OPERATION

### **1.11 BASIC PRINCIPLES OF OPERATION.**

**1.11.1 Principles of Operation (MILES 2000).** The MILES 2000 system uses laser beams to simulate actual weapons fire. An eye-safe invisible laser beam is sent out by each weapon's transmitter when it is fired. The laser beam is coded, and simulates all of the weapon's capabilities including range, accuracy, and destructive capability.

Laser detector systems are used to sense incoming fire. The detector systems register incoming laser beams and determine whether they have scored a Near Miss, Hit, or Kill. Incoming fire can result in more than one type of a Hit or Kill for vehicles. Types of Hits or Kills include Mobility, Communications, Firepower, or a Catastrophic Kill of an entire vehicle.

Table 1-5 defines the Kill Indication Chart.

**1.11.2 Principles of Operation Individual Weapons System (IWS).** The IWS may be used as stand-alone MILES 2000 equipment for dismounted troops or in conjunction with MILES 2000-equipped vehicles, surrogate weapons, or crew-served weapons. Individual weapons are fired using normal procedures. Weapons are loaded with blank ammunition and must have blank firing adapters (BFA) attached. The sound and flash of blank fire is sensed by the SAT, which triggers the weapons transmitter. The laser transmitter will operate as long as blank ammunition is being fired.

Detectors are mounted on the Torso Harness and Helmet Harness of the IWS, which generate electrical signals that are fed to the IWS Console (DPCU) attached to the Torso Harness. The IWS Console (DPCU) identifies the type of weapon and the PID that fired the incoming laser beam. It determines whether the laser shot was accurate enough to cause a Kill or whether a Near Miss occurred. It also determines the Probability of Kill (Pk) for that weapon. The probability of killing a target is different for each type of attacking weapon.

**1.11.3 Configuration.** Each individual wears a Helmet Harness equipped with four laser detectors, a Torso Harness equipped with eight laser detectors, an IWS Console (DPCU) attached to the Torso Harness and an audio alarm. When the detectors on the IWS sense a MILES 2000-equipped weapon being fired, one of three things will happen:

- a. Alarm sounds briefly two times – a Near Miss occurred.
- b. Alarm sounds continuously – individual has been killed. If a SAT has been "Enabled," the alarm will sound continuously until that SAT has been located and "Disabled." If a SAT has not been "Enabled," the alarm will sound approximately 5-10 seconds.
- c. Alarm sounds briefly four times – the IWS has been reset by the controller.

Table 1-6 defines the Kit/Equipment List.

**Table 1-5. Kill Indication Chart.**

TYPE OF HIT/KILL	NUMBER OF KSI FLASHES	AUDIBLE INDICATION
<b>Vehicle</b>		
Shoulder-Mounted Assault Weapon (SMAW) Spotting Rifle	1 Flash	None
Near Miss	2 Flashes	Near Miss.
Hit	4 Flashes	Hit.
Mobility Kill	4 Flashes	Hit, Mobility. Stop Vehicle. (The crew has 20 secs to bring the vehicle to a stop.)
Fire Power Kill	4 Flashes	Hit, Fire Power.
Communications Kill	4 Flashes	Hit, Commo Kill. (disables external communications only)
Catastrophic Kill	Flashes Continuously	Vehicle Kill
Administrative Kill	Flashes Continuously	Vehicle Kill
Cheat Kill	Flashes Continuously	Cheat Kill
Reset/Resurrect	1 Flash	Reset/Resurrect
<b>IWS</b>		
Near Miss	N/A	2 Beeps
Kill	N/A	Continuous
Administrative Kill	N/A	Continuous
Cheat Kill	N/A	Continuous
Reset/Resurrect	N/A	4 Beeps
<p>Notes: Cheat Kill will occur during a Mobility Kill if the vehicle does not stop within the allotted 20 seconds or moves after it has stopped. A Cheat Kill will occur when disconnecting any of the following pieces of vehicle equipment: Kill Status Indicator (KSI), any Detector Belt/Array, or Power Controller (must be reconnected for cheat to be indicated), or removing the battery on IWS Console (DPCU).</p> <p>The KSI is issued as part of a separate equipment kit.</p> <p>In the event of a Catastrophic or Communications Kill, external communications can be over-ridden for <b>EMERGENCIES ONLY</b> by pressing the USER INFO push button on the Control Unit, selecting communication override and pressing the ENTER push button.</p>		

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M16A2</b>				
<b>PACKAGE PERTAINS TO: 147400-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M16A2	147660	147660-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-7	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M16A2</b>				
<b>PACKAGE PERTAINS TO: 147400-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M16A2	147660	147660-2	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-7	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M16A2/M4</b>				
<b>PACKAGE PERTAINS TO: 147400-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M16A2/M4	148465	148465-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-9	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-2 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M24</b>				
<b>PACKAGE PERTAINS TO: 147450-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24/M40	147636	147636-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-1	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

**TD 23-6920-702-10**  
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**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M24</b>				
<b>PACKAGE PERTAINS TO: 147450-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24/M40	147636	147636-2	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-1	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b>  1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M24</b>				
<b>PACKAGE PERTAINS TO: 147450-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24/M40	147636	147636-3	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-1	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b>  1. MAX. QTY. OF 24 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-2 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M249</b>				
<b>PACKAGE PERTAINS TO: 147500-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M249	147643	147643-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-2	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M249</b>				
<b>PACKAGE PERTAINS TO: 147500-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M249	147643	147643-2	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-2	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.



**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List - Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M249</b>				
<b>PACKAGE PERTAINS TO: 147500-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M249	147643	147643-3	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-2	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 24 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-2 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M60</b>				
<b>PACKAGE PERTAINS TO: 147550-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M60	147621	147621-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-3	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List - Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M60</b>				
<b>PACKAGE PERTAINS TO: 147550-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M60	147621	147621-2	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-3	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M60</b>				
<b>PACKAGE PERTAINS TO: 147550-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M60	147621	147621-3	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-3	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 24 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-2 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M2</b>				
<b>PACKAGE PERTAINS TO: 147600-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M2	147571	147571-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-4	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 14 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-3 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M2</b>				
<b>PACKAGE PERTAINS TO: 147600-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M2	147571	147571-3	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-4	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 14 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-3 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M2</b>				
<b>PACKAGE PERTAINS TO: 147600-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M2	147571	147571-5	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-4	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 18 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-4 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M40</b>				
<b>PACKAGE PERTAINS TO: 147650-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24,M40	147636	147636-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-5	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M40</b>				
<b>PACKAGE PERTAINS TO: 147650-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24, M40	147636	147636-2	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-5	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M40</b>				
<b>PACKAGE PERTAINS TO: 147650-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M24, M40	147636	147636-3	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-5	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 24 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-2 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M240G</b>				
<b>PACKAGE PERTAINS TO: 147700-1</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M240G	147576	147576-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-1	
AR	TRANSIT CASE, IWS	147399	147399-6	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M240G</b>				
<b>PACKAGE PERTAINS TO: 147700-2</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M240G	147576	147576-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	147421	147421-2	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	147422	147422-2	
AR	TRANSIT CASE, IWS	147399	147399-6	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 20 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

See Figure 1-1 located at the end of this table.

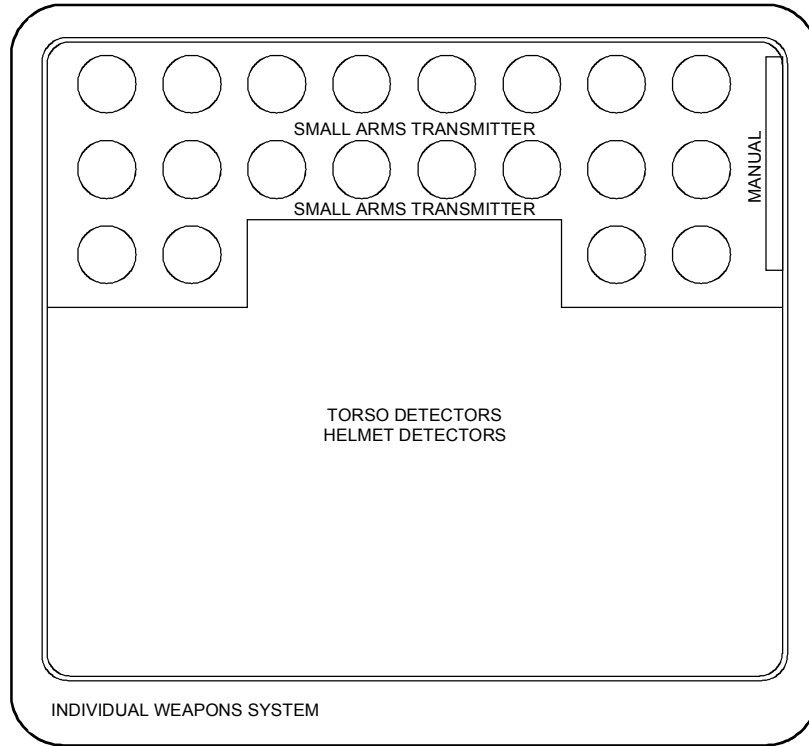
**TD 23-6920-702-10**  
**TM 6920-10/7**

**Table 1-6. Kit/Equipment List – Continued.**

<b>PACKAGE NOMENCLATURE: SIMULATION SYSTEM, IWS, M240B/G</b>				
<b>PACKAGE PERTAINS TO: 147700-3</b>				
<b>PACKAGE CONTENTS</b>				
<b>QUANTITY</b>	<b>NAME OF ITEM</b>	<b>DWG NO.</b>	<b>PART NO.</b>	<b>NOTES</b>
1	SAT ASSY, M240 UNIVERSAL	148460	148460-1	
1	DETECTOR ASSEMBLY, TORSO (TORSO HARNESS)	148245	148245-1	
1	DETECTOR ASSEMBLY, HELMET (HELMET HARNESS)	148246	148246-1	
AR	TRANSIT CASE, IWS	147402	147402-6	1, 2
AR	OPERATOR'S MANUAL		TD 23-6920-702-10	
<b>NOTES:</b> 1. MAX. QTY. OF 24 IWS KITS MAY BE PACKED IN ONE TRANSIT CASE. 2. MARK THE TRANSIT CASE (2 PLACES) WITH THE APPLICABLE DASH NUMBER AFTER THE BASIC PART NUMBER. THE MARKING SHALL BE 6.35mm HIGH CHARACTERS MINIMUM, COLOR WHITE NO. 27925 IN ACCORDANCE WITH FED-STD-595. LOCATE AS SHOWN ON THE TRANSIT CASE DRAWING.				

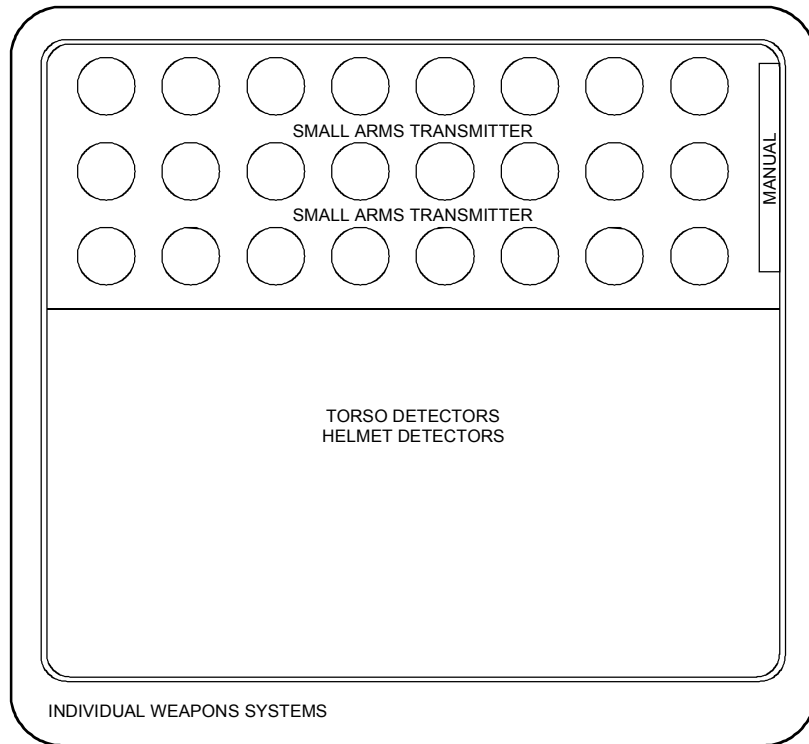
See Figure 1-2 located at the end of this table.

**TD 23-6920-702-10**  
**TM 6920-10/7**



32000017-DT/1  
PN 147399

**Figure 1-1. IWS Transit Case (PN 147399-1 thru -3, and -5 thru -9).**

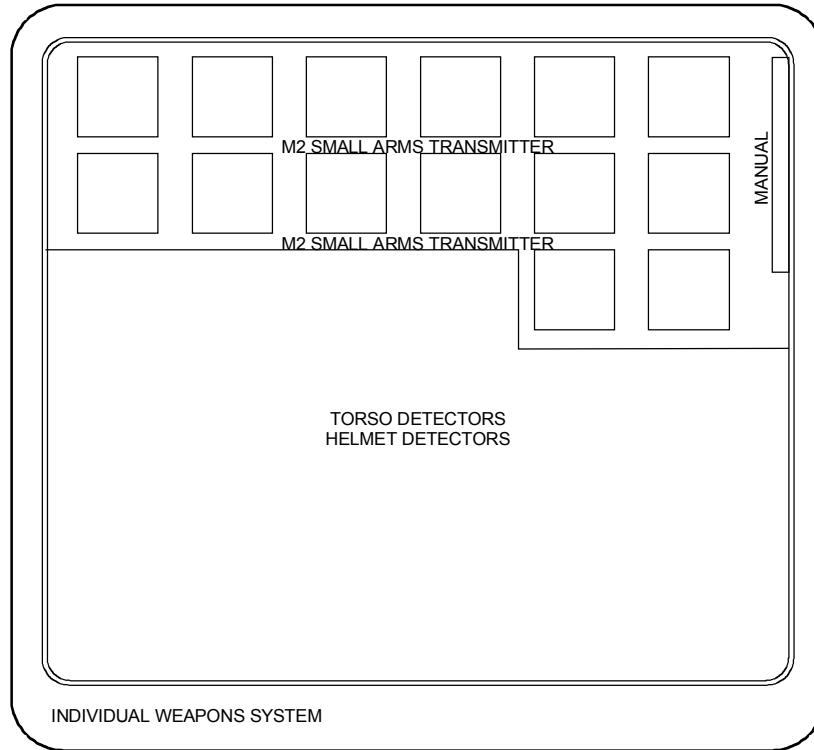


32000046-DT/1  
PN 147402

**Figure 1-2. IWS Transit Case (PN 147402-1 thru -3, and -5 thru -9).**

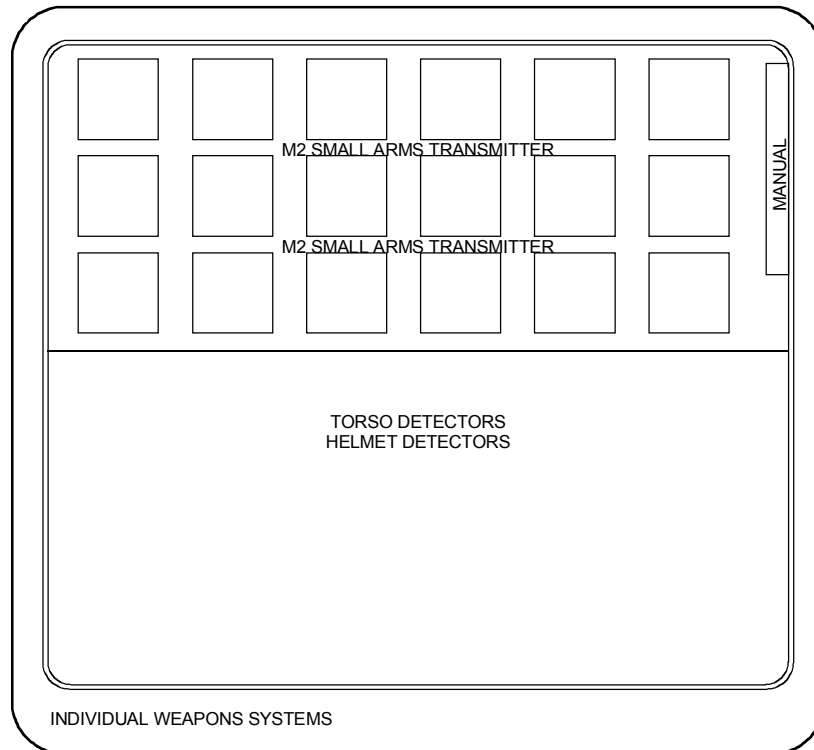


**TD 23-6920-702-10**  
**TM 6920-10/7**



32000018-DT  
 PN 147399

**Figure 1-3. IWS Transit Case (PN 147399-4 Only).**



32000047-DT  
 PN 147402

**Figure 1-4. IWS Transit Case (PN 147402-4 Only).**

**TD 23-6920-702-10**  
**TM 6920-10/7**

## CHAPTER 2 OPERATING INSTRUCTIONS

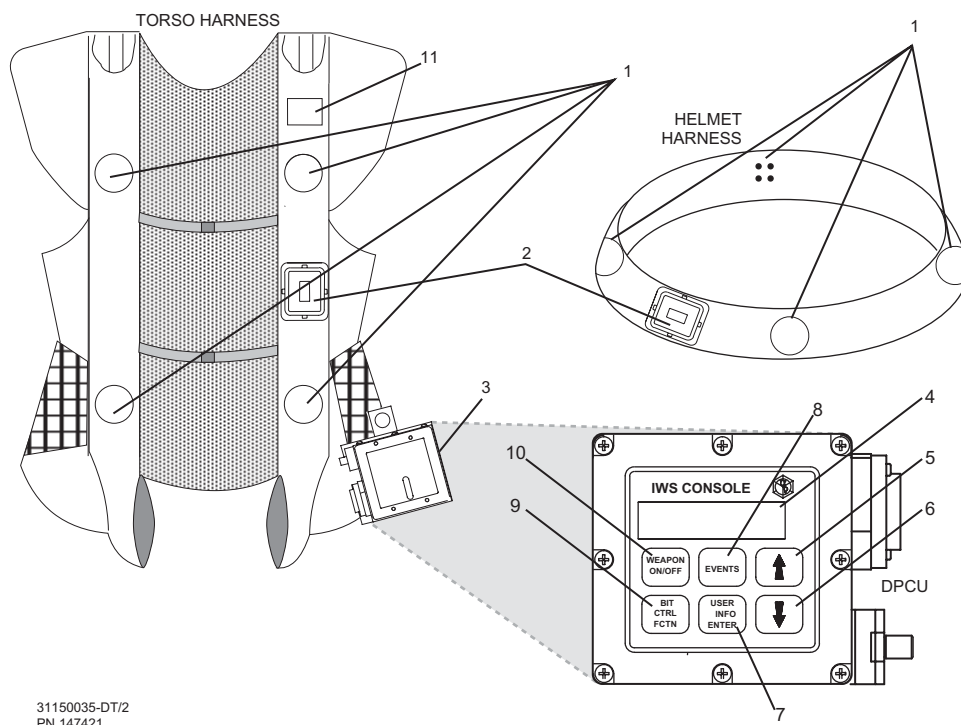
### SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

#### **2.1 EQUIPMENT CONTROLS AND INDICATORS.**

The following figures, as listed in Table 2-1, illustrate and describe the MILES 2000 IWS operating controls and indicators.

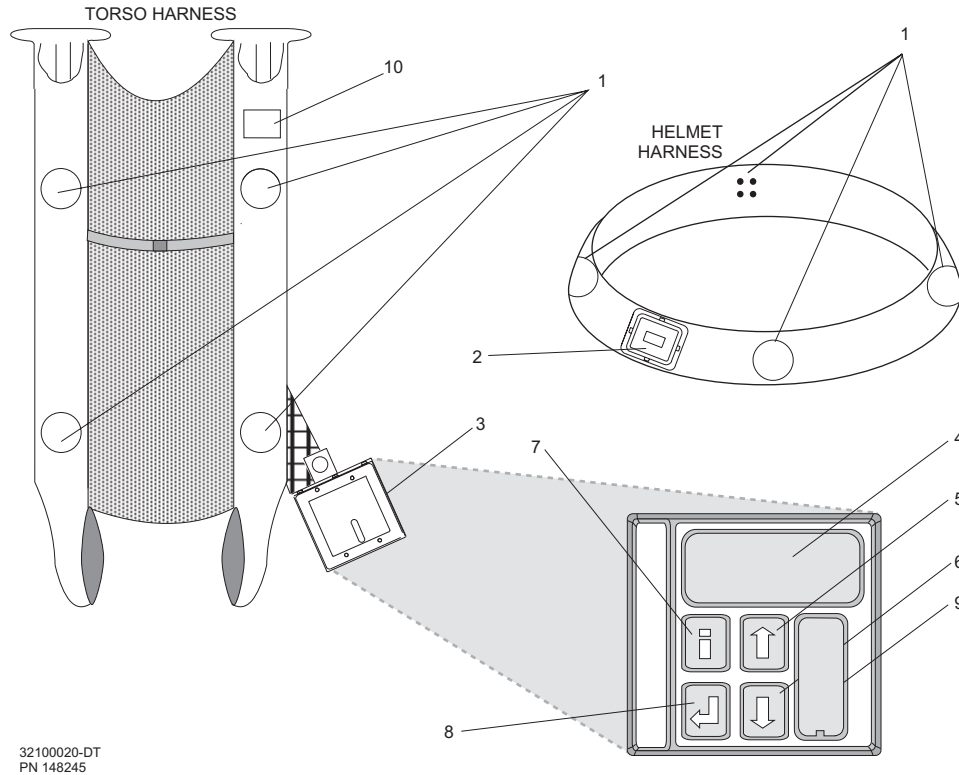
**Table 2-1. Controls and Indicators Reference.**

ITEM	FIGURE NO.
Individual Weapons System (IWS) PN 147421	2-1
Individual Weapons System (IWS) PN148245	2-2
Small Arms Transmitter (SAT)	2-3



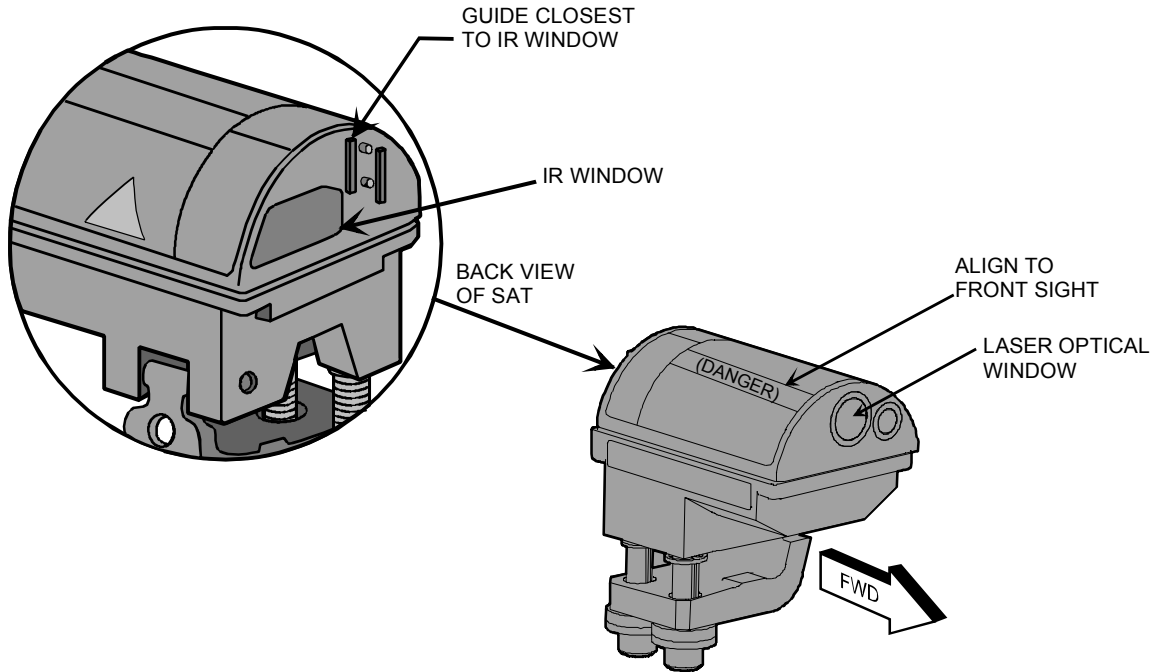
**Figure 2-1. Individual Weapons System (IWS) PN 147421.**

1. DETECTORS. The laser detectors receive coded messages from incoming laser transmitters.
2. AMPLIFIER. Amplifies coded messages received from incoming laser transmitters and forwards them to the IWS Console (DPCU) for decoding.
3. IWS CONSOLE [DATA PROCESSING CONTROL UNIT (DPCU)]. Provides user interface and decodes the laser and IR transmitted data for the IWS. Powered by 9-volt battery with approximately 72-hours battery life.
4. DISPLAY WINDOW. Displays system messages.
5. SCROLL UP PUSH BUTTON. Scrolls display up when pressed.
6. SCROLL DOWN PUSH BUTTON. Scrolls display down when pressed.
7. USER INFO/ENTER PUSH BUTTON. Displays user information on the display window and provides enter function for information input.
8. EVENTS PUSH BUTTON. Recalls up to the 16 most recent events when pushed.
9. BIT/CTRL FCTN PUSH BUTTON. Executes Built-in-Test (BIT) and provides various control functions to the user.
10. WEAPON ON/OFF PUSH BUTTON. Enables/disables the SAT via an IR link when pressed.
11. INFRARED (IR) TRANSMITTER. IR communication link between the SAT and the IWS Console (DPCU). Transmits PID and ENABLE/DISABLE to SAT.



**Figure 2-2. Individual Weapons System (IWS) PN 148245.**

1. DETECTORS. The laser detectors receive coded messages from incoming laser transmitters.
2. AMPLIFIER. Amplifies coded messages received from incoming laser transmitters and forwards them to the IWS Console (DPCU) for decoding.
3. IWS CONSOLE [DATA PROCESSING CONTROL UNIT (DPCU)]. Provides user interface and decodes the laser and IR transmitted data for the IWS. Powered by an internal 3.6-volt lithium battery with approximately a 12-month battery life.
4. DISPLAY WINDOW. Displays system messages.
5. SCROLL UP PUSH BUTTON. Toggles through menu displays and scrolls display up when pressed.
6. SCROLL DOWN PUSH BUTTON. Toggles through menu displays and scrolls display down when pressed.
7. INFO/ESCAPE PUSH BUTTON. Provides Escape functions.
8. ENTER PUSH BUTTON. Provides Enter function for information input.
9. OPTICAL PORT. Bidirectional IR communication link used by Controller Device/Training Data Transfer Device (CD/TDTD) (Controller Gun) for uploading and downloading data.
10. INFRARED (IR) TRANSMITTER. IR communication link between the SAT and the IWS Console (DPCU). Transmits PID and ENABLE/DISABLE to SAT.



32100190-DT

**Figure 2-3. Small Arms Transmitter (SAT).**

1. **FIRING INDICATOR AND IR TRANSMITTER/RECEIVER PORT.** Firing indicator illuminates when the SAT is fired as a visual aide to the soldier/marine. IR Port provides a link between the weapon and the IWS.
2. **ALIGNMENT SHAFTS.** Used to adjust the laser alignment with the ASAAF.
3. **BLANK SENSOR WINDOW.** Allows light flash from blank firing of the weapon to be sensed so that the SAT laser will be transmitted
4. **LASER OPTICAL WINDOW.** Window through which the SAT laser beam is transmitted.

## SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Preventive Maintenance Checks and Services (PMCSs) will ensure the MILES 2000 equipment will be ready for operation and perform satisfactorily throughout its mission. Preventive maintenance checks consist of performing a systematic inspection to discover defects before they result in operational failure of the equipment. Defects or malfunctions discovered by the crew during use of the MILES 2000 equipment, or as a result of performing maintenance checks and services, will be reported using the proper forms.

### 2.2 INTRODUCTION TO PMCS TABLE.

Operator PMCSs are shown in Table 2-2. Tasks to be performed before operation appear in the “B” column under the heading “Interval.” Tasks to be performed during operation are checked in the “D” column. Tasks to be performed after operation are checked in the “A” column. Tasks to be performed weekly are checked in the “W” column, with tasks to be performed monthly checked in the “M” column.

#### NOTE

Cleaning of MILES 2000 equipment requires no special procedures or the use of cleaning compounds/chemicals. Clean all areas, including the lens area by: (1) wiping dirt and dust away using a soft rag; (2) clean with a soft cloth rag dampened with water; and (3) polish to a brilliant luster with a finishing cloth. **The use of chemicals to clean MILES equipment, including the cleaning of lenses, is not recommended.**

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**NOTE**

Within designated interval, these checks are to be performed in the order listed.

B – Before Operation                      W – Weekly  
D – During Operation                      M – Monthly  
A – After Operation

**Table 2-2. Operator Preventive Maintenance Checks and Services.**

ITEM NO.	ITEM TO BE INSPECTED	INTERVAL					PROCEDURES CHECK FOR AND HAVE REPAIRED	EQUIPMENT IS NOT READY/AVAILABLE IF:
		B	D	A	W	M		
1.	IWS Console (DPCU)	✓		✓		✓	Inspect for cracks in display window and membrane switches.	Display window or membrane switch broken or cracked.
			✓	✓			Check for display in display window when battery is installed.	No display in display window.
		✓					Check for battery in unit(if applicable)	Battery not present (if applicable).
2.	IWS Manworn (Torso Harness and Helmet Harness)	✓		✓		✓	Wipe all detectors clean. Inspect harness for damage that would prevent normal operation.	Detectors broken or missing. Amplifier cracked, broken, or missing. See Note.
3.	Small Arms Transmitter (SAT)	✓		✓		✓	Inspect for dirty or damaged window. Clean window.	Window broken, cracked, or missing.

**NOTE**

The amplifier is an internal part of the IWS Console (DPCU) starting with PN 148245.



## SECTION III. OPERATION UNDER USUAL CONDITIONS

### **2.3 INDIVIDUAL WEAPONS SYSTEM (IWS) OPERATIONS.**

- a. Installation instructions and procedures for IWS Part Number (PN) 147421 and IWS PN 148245 are different.
  - (1) For PN 147421, please follow instructions and procedures given in paragraph 2.3.1 thru paragraph 2.3.1.10.
  - (2) For PN 148245, please follow instructions and procedures given in paragraph 2.3.2 thru paragraph 2.3.2.10.

#### **NOTE**

When using installation instructions and procedures for PN 147421, make sure you follow paragraph 2.3.1 thru paragraph 2.3.1.10 to ensure correct instructions/procedures for this PN.

**2.3.1 IWS (PN 147421).** The IWS consists of the Torso Harness with the IWS Console (DPCU), the Helmet Harness and the SAT.

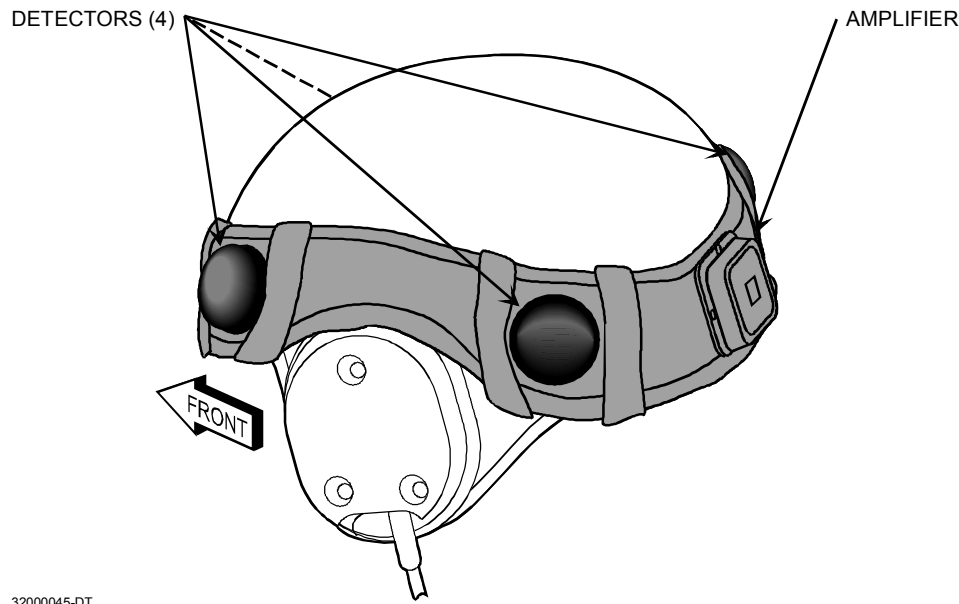
#### **2.3.1.1 Helmet Harness Installation.**

- a. Remove the Helmet Harness from the transit case and inspect the harness for damage.
- b. Wipe all detectors clean.
- c. Replace and report damaged equipment, as required.

#### **NOTE.**

When applying fastener tape, always apply the “hook” type tape to the holding surface (the surface to which an item will be installed), and the “pile” type tape to the item being installed. For example, when installing the Helmet Harness to the helmet Combat Vehicle Crew (CVC only), you would apply the hook tape to the helmet, and the pile tape to the Helmet Harness. The Helmet Harness pile tape can then be attached to the helmet hook tape, firmly securing the harness.

**2.3.1.1.1 CVC Helmet Harness Installation.** (See Figure 2-4.)



**Figure 2-4. CVC Helmet Harness.**

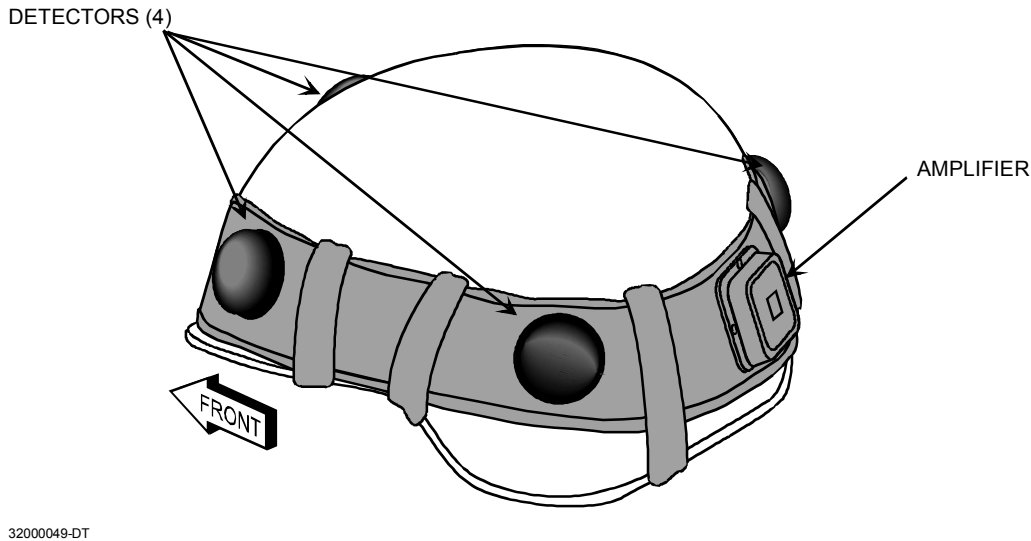
- a. The Helmet Harness consists of a wide elasticized band with four detectors, an amplifier, and three patches of fastener tape. Ensure that the fastener strips are unrolled and not tangled.
- b. Slip the Helmet Harness over the helmet with the amplifier to the rear of the helmet. Smooth out any wrinkles or twists. Ensure the harness fits snugly just above the helmet brim.
- c. Mark the helmet where the fastener tape patches touch the helmet. Remove the harness.

**WARNING**

Tape primer is toxic and highly flammable. Do not spray near heat, open flame, or sparks. Use primer only in well ventilated areas. Do not permit smoking in the area. Injury to personnel may result.

- d. Spray tape primer over the marked areas where the fastener tape will be attached. Let the primer dry thoroughly (follow the directions on the primer can), before applying tape.
- e. Cut three strips of fastener tape approximately two inches long. Remove the backing paper and press the tape patches firmly onto the helmet where the primer was applied.
- f. Place the Helmet Harness around the helmet.
- g. Adjust the harness so the three patches of fastener tape inside line up with the three pieces on the helmet. (Ensure that there are no wrinkles or twists in the harness.) Press the tape on the harness firmly against the tape on the helmet.

**2.3.1.1.2 Standard Helmet Harness Installation.** (See Figure 2-5.)



**Figure 2-5. Standard Helmet Harness.**

- a. The Helmet Harness consists of a wide elasticized band with four detectors, an amplifier, and nine fastener strip extensions. Ensure that the fastener strips are unrolled and not tangled.
- b. Slip the Helmet Harness over the helmet with the amplifier to the rear of the helmet. Smooth out any wrinkles or twists. Ensure the harness fits snugly just above the helmet brim.
- c. Take each fastener strip and run it inside the helmet, underneath the webbing, then over the webbing. Attach the portion of the strip over the webbing to the portion of the strip underneath the webbing. Make sure the attachment is secure.

**2.3.1.1.3 Soft Cover Helmet Harness Installation**

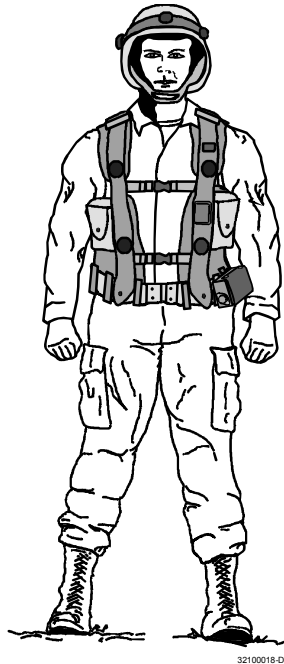
- a. The Helmet Harness consists of a wide elasticized band with four detectors and an amplifier.
- b. Slip the Helmet Harness over the soft cover with the amplifier to the rear of the cover. Smooth out any wrinkles or twists.
- c. Using the black, 3-inch safety pins, secure the Helmet Harness to the cover, working from the inside of the cover out, and then back in again.
- d. Place the cover on your head and ensure the harness fits snugly just above the cover brim. Adjust the harness if it is too snug or too loose, via the safety pins.

### **2.3.1.2 Torso Harness Installation (PN 147421)**

- a. Remove the Torso Harness from the transit case and inspect for damage.
- b. Replace and report damaged equipment, as required.
- c. Wipe all detectors and the IWS Console (DPCU) clean.
- d. Put vest on and fasten two vest clips. (See Figure 2-6.)
- e. Install the battery in the IWS Console (DPCU) by loosening the thumbscrew and opening the battery door. Insert a 9-volt battery and secure the battery door using the thumbscrew.

#### **CAUTION**

Ensure battery door/cap is securely closed during storage and operations, or damage can occur to the battery door/cap.



**Figure 2-6. Torso Harness Installation (PN 147421).**

### **2.3.1.3 SAT Installation.**

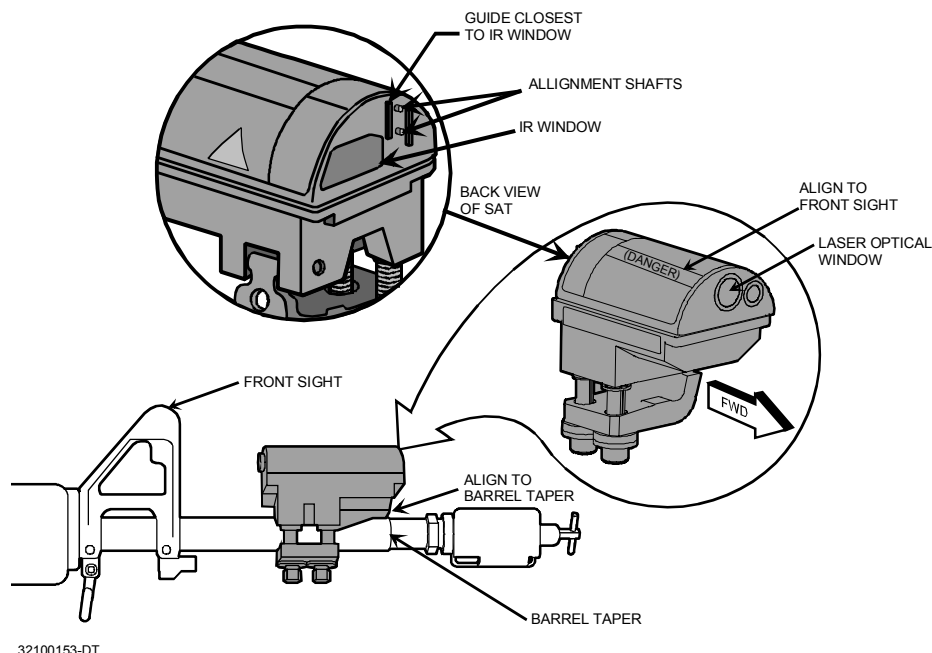
#### **WARNING**

Ensure the weapon has the correct blank fire adapter and it is attached to the weapon correctly. Failure to install the blank adapter when firing blank ammunition could result in serious injury or death.

#### **NOTE**

Inspect the front and rear windows of the SAT. Ensure that they are free from dirt and carbon buildup.

**2.3.1.3.1 M16A2/M4 SAT Installation.** (See Figure 2-7.)



**Figure 2-7. M16A2/M4 SAT.**

- a. Loosen the SAT socket head capscrews and open the clamp.
- b. Hold the SAT with the Laser Optical Window pointing forward. Place the SAT on the barrel of the rifle (forward of the front sight) aligning the front of the SAT housing to the start of the barrel taper.
- c. With the barrel of the rifle pointed downrange, look toward the front sight. Position the SAT so that the **white** line above the **danger** label on the SAT (or the Guide closest to the IR Window) is aligned to the front sight.

**CAUTION**

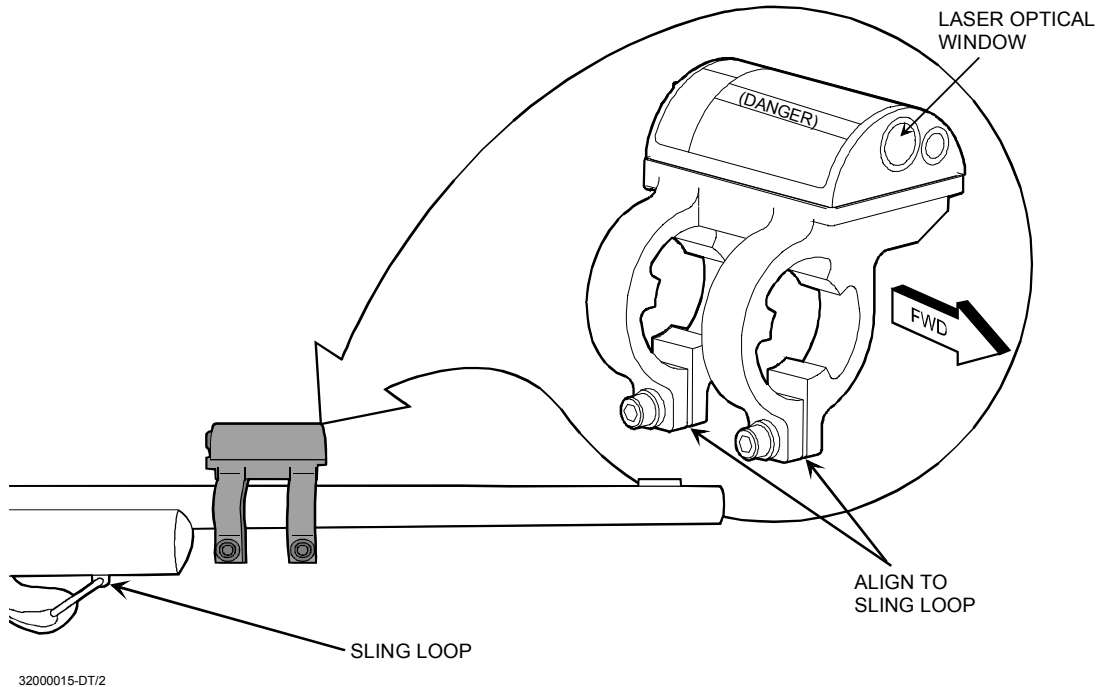
Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

- d. Close the clamp and tighten the SAT socket head capscrews equally until finger tight.
- e. Torque the SAT socket head capscrews to 85 inch-pounds using the torque wrench supplied in the ASAAF kit.
- f. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

**NOTE**

When the Alignment Head is installed on the SAT, ensure that the scope crosshair is located within the Heads Up Display (Optic Unit). If not, repeat steps c. thru e. of paragraph 2.3.1.3.1.

**2.3.1.3.2 M24 and M40 SAT Installation.** (See Figure 2-8.)



**Figure 2-8. M24 and M40 SAT.**

- a. Loosen the SAT socket head capscrews and open the clamp.
- b. Hold the SAT with the Laser Optical Window pointing forward. Slide the SAT far enough down on the barrel until the SAT is snug.
- c. Slightly rotate the SAT so that the bottom of the clamp is lined up with the sling loop on the front stock. This will ensure that the SAT is at its most vertical position.

**CAUTION**

Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

- d. Close clamp and tighten SAT socket head capscrews equally until finger tight.
- e. Torque the SAT socket head capscrews to 60 inch-pounds using the torque wrench supplied in the ASAAF kit.
- f. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

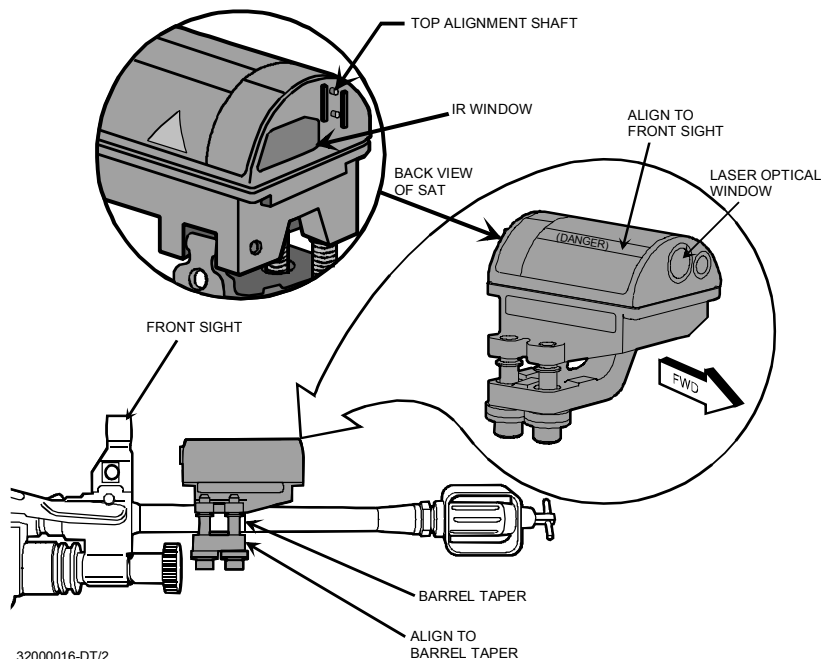
**NOTE**

When the Alignment Head is installed on the SAT, ensure the scope crosshair is located within the Heads Up Display (Optic Unit). If not,

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**TM 6920-10/7**

repeat steps c. thru e. of paragraph 2.3.1.3.1 until the SAT is positioned correctly.

**2.3.1.3.3 M249 SAT Installation.** (See Figure 2-9.)



**Figure 2-9. M249 SAT.**

- a. Loosen the SAT socket head capscrews and open the clamp.
- b. Hold the SAT with the Laser Optical Window pointing forward. Place the SAT toward the front of barrel approximately 1.25 inches forward of the front sight post (to ensure ASAAF clearance). Align front of the SAT clamp to the barrel taper.
- c. With the barrel of the rifle pointed downrange, look toward the front sight. Position the SAT so that the **center** of the **danger** label on the SAT (or the top alignment shaft) is aligned to the front sight.

**CAUTION**

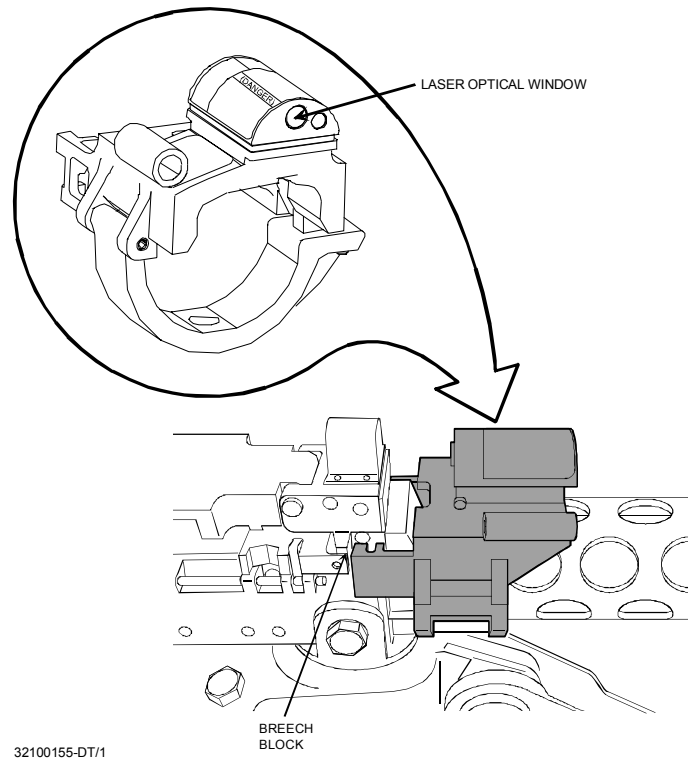
Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

- d. Close the clamp and tighten the SAT socket head capscrews equally until finger tight.
- e. Torque the SAT socket head capscrews to 85 inch-pounds using the torque wrench supplied in the ASAAF kit.
- f. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

**NOTE**

When the Alignment Head is installed on the SAT, ensure that the scope crosshair is located within the Heads Up Display (Optic Unit). If not, repeat steps c. thru e. of paragraph 2.3.1.3.1.

**2.3.1.3.4 M2 SAT Installation.** (See Figure 2-10.)



**Figure 2-10. M2 SAT.**

- a. Loosen the SAT socket head capscrews and open the clamp to allow placement on the machine gun cooling jacket.
- b. Hold the SAT with the Laser Optical Window pointing forward. Slide the SAT over the barrel and AROUND THE COOLING JACKET, butting up against the breech block.

**CAUTION**

Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrew until directed.

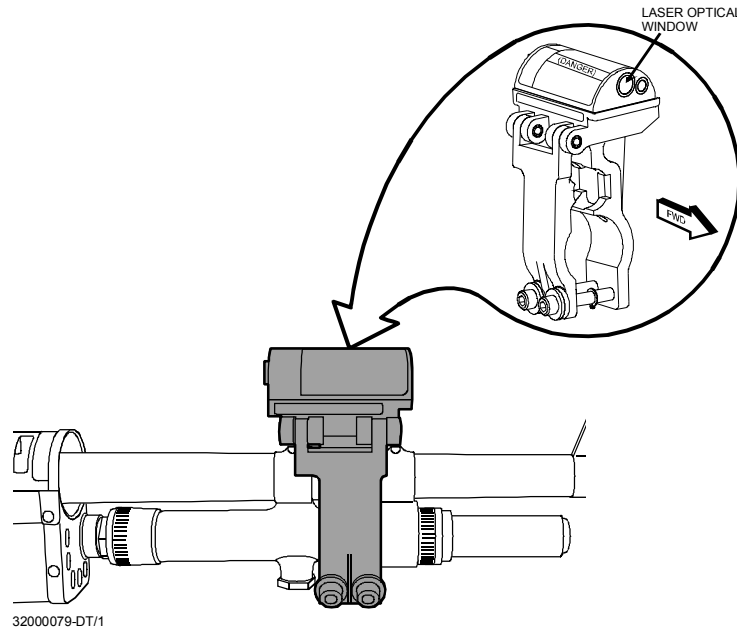
- c. Close the clamp and tighten the SAT socket head capscrews equally until finger tight.
- d. Torque the SAT socket head capscrews to 85 inch-pounds using the torque wrench supplied in the ASAAF kit.
- e. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

**NOTE**



When the Alignment Head is installed on the SAT, ensure that the scope crosshair is located within the Heads Up Display (Optic Unit). If not, repeat steps c. thru e. of paragraph 2.3.1.3.1.

**2.3.1.3.5 M60 SAT Installation.** (See Figure 2-11.)



**Figure 2-11. M60 SAT.**

- a. Loosen the SAT socket head capscrews and open clamp.
- b. Hold the SAT with the Laser Optical Window pointing forward. Slide the SAT toward the front of the barrel behind the front sights.

**NOTE**

SAT should be positioned between the two clamps that connect the gas tube to the barrel of the weapon.

**CAUTION**

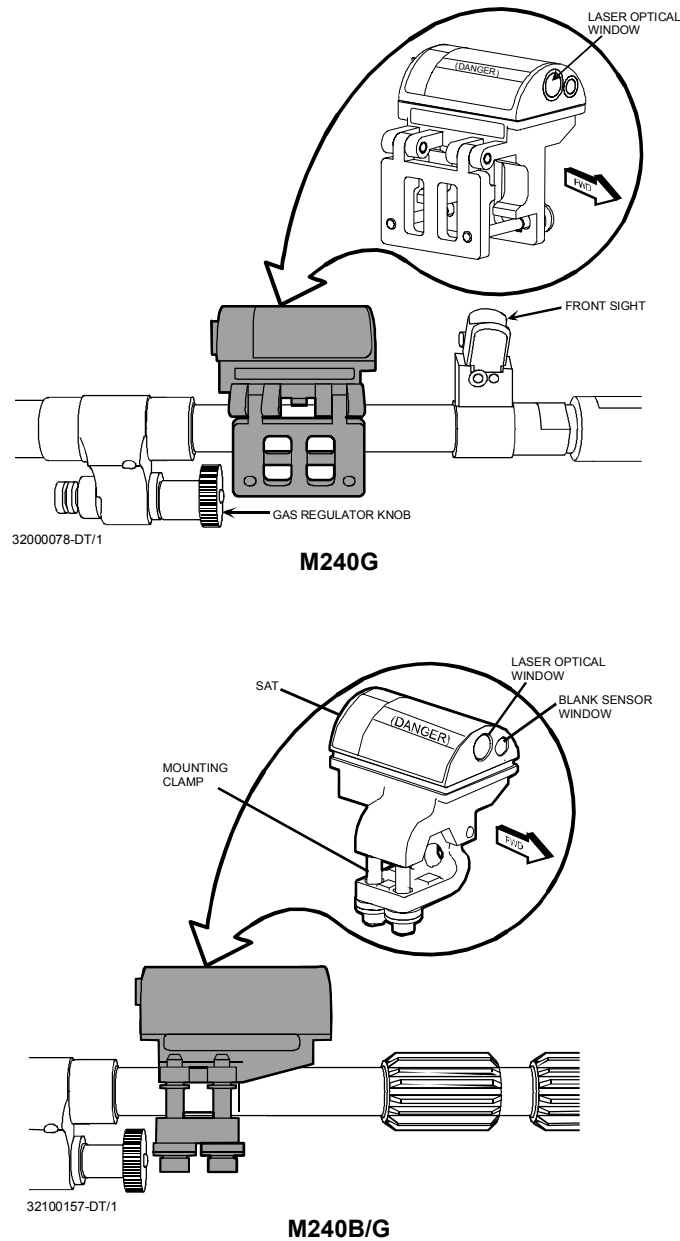
Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

- c. Close the clamp and tighten the SAT socket head capscrews equally until finger tight.
- d. Torque the SAT socket head capscrews to 85 inch-pounds using the torque wrench supplied in the ASAAF kit.
- e. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

**NOTE**

When the Alignment Head is installed on the SAT, ensure that the scope crosshair is located within the Heads Up Display (Optic Unit). If not, repeat steps c. thru e. of paragraph 2.3.1.3.1.

**2.3.1.3.6 M240G SAT Installation.** (See Figure 2-12.)



**Figure 2-12. M240B/G SAT.**

- Loosen the SAT socket head capscrews and open clamp.
- Hold the SAT with the Laser Optical Window pointing forward. Slide the SAT toward the front of the barrel behind the front sights and approximately .5 to 1 inch in front of the gas regulator knob. (Ensure ASAAF clearance behind front sight.)

**CAUTION**

Use care when starting capscrews not to cross threads. **DO NOT** use any tools to tighten capscrews until directed.

- c. Close the clamp and tighten the SAT socket head capscrews equally until hand tight.
- d. Torque the SAT socket head capscrews to 60 inch-pounds using the torque wrench supplied in the ASAAF kit.
- e. Align the SAT using the ASAAF. Refer to TD 23-6920-705-10/TM 6920-10/2, ASAAF OPS Manual.

**NOTE**

When the Alignment Head is installed on the SAT, ensure that the scope crosshair is located within the Heads Up Display (Optic Unit). If not, repeat steps c. thru e. of paragraph 2.3.1.3.1.

**2.3.1.4 Initial Adjustments, Before Use, Daily Checks, and Self-Test Requirements.** Before operating MILES 2000 equipment, perform the following:

- a. Ensure PMCSs described in Section II have been performed.
- b. Ensure the front and rear windows are free from dirt and carbon buildup.
- c. Align the SAT with the ASAAF. Refer to TD 23-6020-705-10/TM 6920-10/2, ASAAF OPS Manual.
- d. Perform the Functional Checks described in Section V.
- e. Test the MILES 2000 equipment as follows:
  - (1) Ask the Controller to test your Torso Harness with the CD/TDTD (Controller Gun) set to NEAR MISS.
  - (2) When the Controller fires, the alarm on your Torso Harness should sound with two beeps. (If you are "KILLED," the alarm will sound with a continuous tone and the Controller will have to reset your IWS.)
  - (3) Ask the Controller to use the same procedures to test your Helmet Harness.
  - (4) If any equipment does not respond correctly, refer to the Troubleshooting Procedures of Chapter 3, Section I.

**2.3.1.5 Power-On Procedures (PN 147421)**

- a. Install the 9-volt battery in the IWS Console (DPCU) by loosening the thumbscrew and opening the battery door. Insert battery and secure the battery door using the thumbscrew. IWS Console (DPCU) will power on and automatically run BIT.

**CAUTION**

Ensure battery door/cap is securely closed during storage and operations, or damage can occur to the battery door/cap.

**NOTE**

During BIT, “Switch Test” will be displayed on the IWS Console (DPCU). Verify push buttons are working properly.

- b. After BIT completes, the IWS Console (DPCU) will display “BIT PASS” or “BIT FAIL.” The system defaults to a “KILLED” status and will sound a tone for approximately five seconds.

**NOTE**

If BIT fails, replace and report damaged equipment as required.

- c. The display will show:

**XXXX KILLED**  
**WEAPON NOT READY**

**NOTE**

“XXXX” in the upper left of the display is the PID.

- d. Have Controller reset the IWS Console (DPCU) using the CD/TDTD (Controller Gun). There will be four beeps and the display will show:

**XXXX READY**  
**WEAPON NOT READY**

**2.3.1.6 Time Sync Procedures (PN 147421).**

- a. Have the Controller Time Sync the IWS using the CD/TDTD (Controller Gun). Aim at any detector and pull the trigger. IWS alarm will beep once.

**NOTE**

Ensure that you use a CD/TDTD (Controller Gun) that has been Time Synchronized by another CD/TDTD (Controller Gun). This ensures that all exercise units and CD/TDTDs (Controller Guns) have the same date and time.

- b. Set the CD/TDTD (Controller Gun) to Clear Events and place the CD/TDTD (Controller Gun) into the IWS Console (DPCU) optical port and pull the trigger.
- c. Press EVENTS push button on the IWS Console (DPCU) to verify it has been cleared.
- d. Time Sync the IWS again using the CD/TDTD (Controller Gun). Aim at any detector and pull the trigger. IWS alarm will beep once.

**2.3.1.7 Weapon Enable Procedures (PN 147421).**

**NOTE**

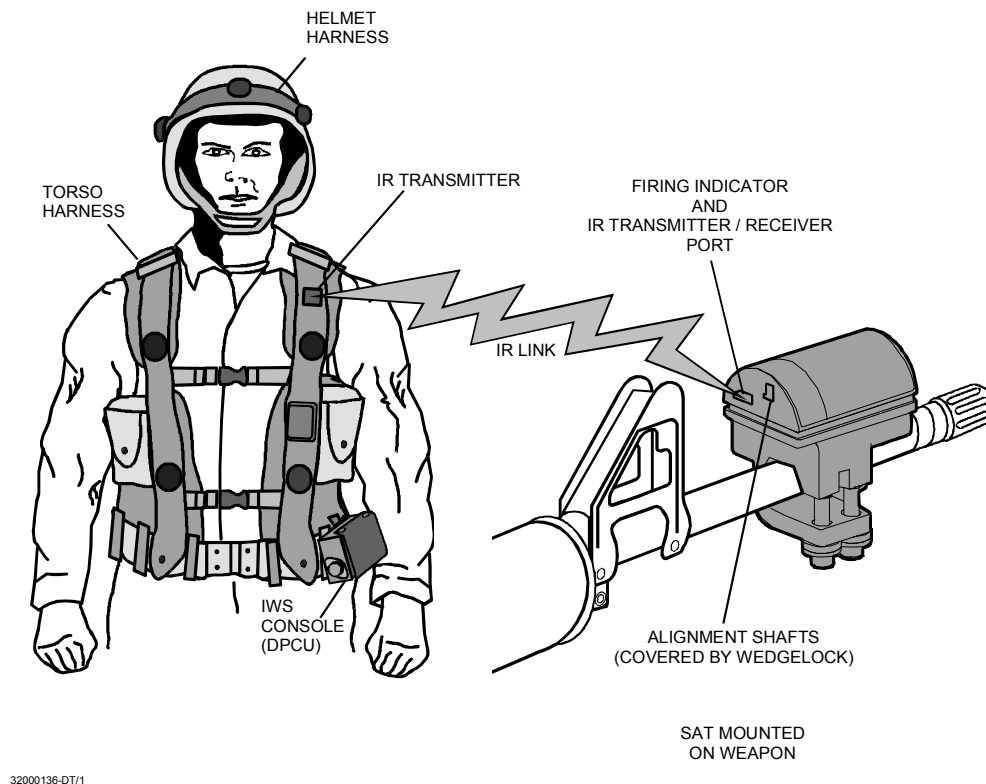
DO NOT enable the SAT until the alignment process has been properly completed.

Ensure the SAT has been properly installed on the weapon and aligned using the ASAAF prior to performing the following steps:

- a. Press the WEAPON ON/OFF push button.
- b. Using the Arrow push buttons, move the cursor to WEAPON ON.
- c. Press the WEAPON ON/OFF push button again. The display will show:

**POSITION WEAPON TO ENABLE**

- d. Position the weapon for communication between the Torso Harness IR Transmitter and the SAT (normal firing position). If the procedure is successful, there will be a single beep from the IWS Console (DPCU). (See Figure 2-13.)



**Figure 2-13. Enable/Disable the SAT.**

- e. The display will show:

**XXXX READY**  
**WEAPON READY**

#### **2.3.1.8 Control Mode Procedures (PN 147421).**

- a. Have the Controller set the IWS Console (DPCU) to Control Mode On using the CD/TDTD (Controller Gun).
- b. The IWS Console (DPCU) will display:

**CONTROL MODE ON**

#### **NOTE**

Pressing any push buttons other than Up and Down arrows, CTRL/FCTN (red label), and ENTER (red label), will shut Control Mode Off.

- c. Press the CTRL/FCTN push button and then ENTER.
- d. The display will show:  
  
**DEFAULT REGULAR**  
**DEFAULT CUSTOM**
- e. Using the Arrow push buttons, move the cursor to DEFAULT REGULAR and press ENTER.
- f. The display will show:  
  
**DEFAULT REGULAR**  
**DEFAULT FLAK**
- g. Using the Arrow push buttons, select the REGULAR or FLAK setting as directed by the Controller.
- h. Press WEAPON ON/OFF push button or EVENTS, or have the Controller turn the Control Mode off. This exits Control Mode and the IWS Console (DPCU) returns to the default screen.

**2.3.1.9 Operations (PN 147421).** The IWS Console (DPCU) alarm will give audible tones (beeps) to alert the user as to the system status:

- a. One beep - control function being executed.
- b. Two beeps - indicates a Near Miss from incoming fire.
- c. Four beeps - indicates the IWS has been Reset or Resurrected.
- d. Continuous tone - indicates a Kill.

**NOTE**

If a Kill occurs while there is no SAT enabled, the tone will shut off after ten seconds. The display will show:

**XXXX KILLED**  
**WEAPON NOT READY**

If the SAT is enabled when a Kill occurs, the tone will be continuous until the SAT has been located and disabled.

Sniper rifles may go into Sleep Mode prior to firing the first round. Rotate the rifle 90° prior to firing it.

**2.3.1.10 Postoperation Procedures (PN 147421).**

a. Disable the SAT:

- (1) Press the WEAPON ON/OFF push button.
- (2) Using the Arrow push buttons, move the cursor to "WEAPON OFF."
- (3) Press the WEAPON ON/OFF push button. The display will show:

**POSITION WEAPON TO DISABLE**

- (4) Position the weapon for communication between the Torso Harness IR Transmitter and the SAT. (See Figure 2-13.)
- (5) If the procedure is successful, there will be a single beep from the IWS Console (DPCU).
- (6) The display will show:

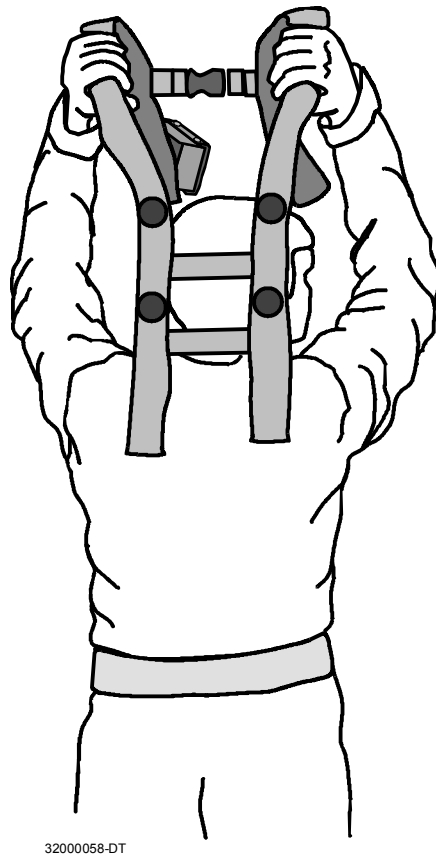
**XXXX READY**  
**WEAPON NOT READY**



**2.3.2 IWS PN 148245.** The IWS consists of the Torso Harness with the IWS Console (DPCU), the Helmet Harness and the SAT.

**2.3.2.1 Helmet Harness Installation.** Refer to procedures described in 2.3.1.1.

**2.3.2.2 Torso Harness Installation (PN 148245).** (See Figure 2-14.)



**Figure 2-14. Torso Harness (PN 148245).**

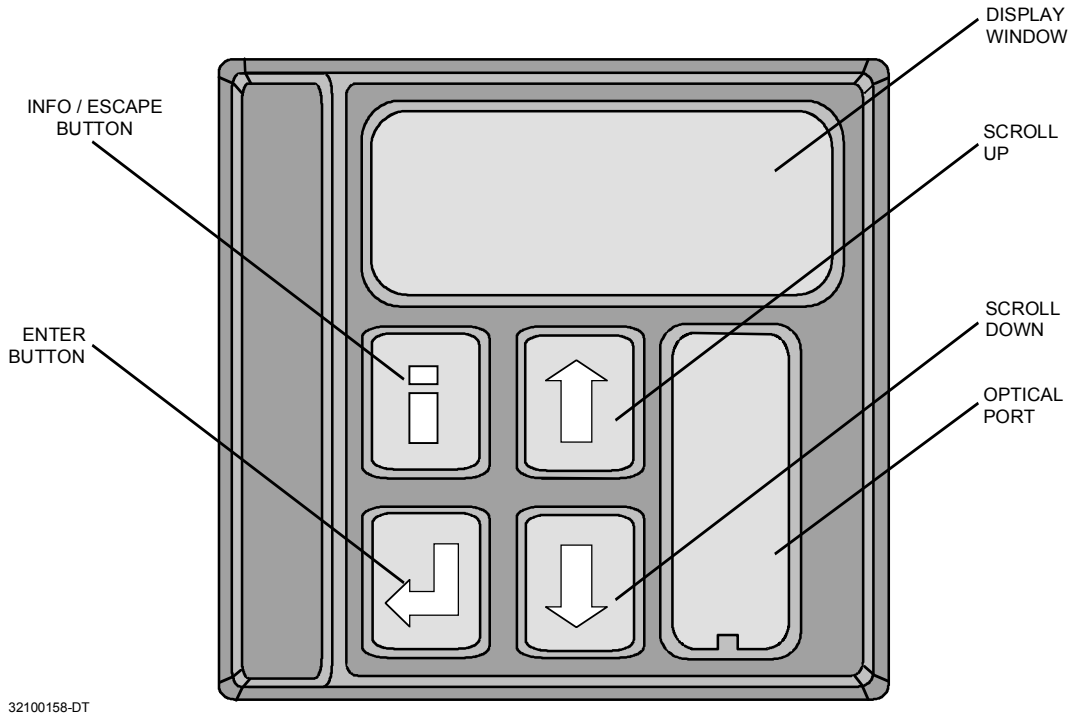
- a. Remove the Torso Harness from the transit case and inspect for damage.
- b. Replace and report damaged equipment, as required.
- c. Wipe all detectors and the IWS Console (DPCU) clean.
- d. To put on the Torso Harness, ensure the IWS Console (DPCU) is in the front. Raise the harness, then lower it over your head and fasten the vest clip. (See Figure 2-14.)

**2.3.2.3 SAT Installation.** Refer to procedures described in 2.3.1.3.

**2.3.2.4 Initial Adjustments, Before Use, Daily Checks, and Self-Test Requirements.** Before operating MILES 2000 equipment, perform the following:

- a. Ensure PMCSs described in Section II have been performed.
- b. Ensure the front and rear windows are free from dirt and carbon buildup.
- c. Align the SAT with the ASAAF. Refer to TD 23-6020-705-10/TM 6920-10/2, ASAAF OPS Manual.
- d. Perform the Functional Checks described in Section V.
- e. Test the MILES 2000 equipment as follows:
  - (1) Wake up DPCU.
    - (a) Idle. The Torso enters idle mode (display goes blank) about ten seconds after processing the last switch push, detector or inductive loop input. The Torso comes out of idle (display comes on) when a switch is pushed, or detector or inductive loop activity is detected.
    - (b) Sleep. The Torso will go to sleep about ten hours after processing the last switch push, detector or inductive loop input. The Torso comes out of sleep (display comes on) when movement is sensed by an internal motion switch and any switch is pressed within 30 seconds. The best way to activate the internal motion switch is to slowly rotate the DPCU. The DPCU should be rotated approximately 90 degrees, through the vertical position and then back to its original position.
  - (2) Ask the Controller to test your Torso Harness with the CD/TDTD (Controller Gun) set to NEAR MISS.
  - (3) When the Controller fires, the alarm on your Torso Harness should sound with two beeps. (If you are "KILLED," the alarm will sound with a continuous tone and the Controller will have to reset your IWS.)
  - (4) Ask the Controller to use the same procedures to test your Helmet Harness.
  - (5) If any equipment does not respond correctly, refer to the Troubleshooting Procedures of Chapter 3, Section I.

**2.3.2.5 Power-On Procedures (PN 148245).** (See Figure 2-15.)



**Figure 2-15. IWS Console (DPCU).**

- a. Wake up IWS Console (DPCU) so that mercury switch is activated and press any button. This will automatically “wake up” (power up) the IWS Console (DPCU).

**NOTE**

The IWS Console (DPCU) does not perform a power-on BIT.

- b. IWS Console (DPCU) default screen will be displayed:

**XXXX KILLED (READY)**  
**WEAPON NOT READY (READY)**

**NOTE**

“XXXX” in the upper left of the display is the PID. The IWS will default to the status it was in prior to going into sleep mode.

- c. Perform a Commanded BIT.
  - (1) Using the Arrow push buttons, toggle the display menus until display shows:

**PRESS ENTER TO**  
**RUN BIT**

- d. Press the ENTER push button. This will execute a BIT.

**NOTE**

During BIT, “Switch Test” will be displayed on the IWS Console (DPCU). Verify push buttons are working properly.

- e. After BIT completes, the IWS Console (DPCU) will display “BIT PASS” or “BIT FAIL.”

**NOTE**

If BIT fails, replace and report damaged equipment, as required.

- f. The display will show:

**XXXX KILLED (READY)**  
**WEAPON NOT READY (READY)**

- g. Have Controller reset (if not already in a “READY” status) the IWS using the CD/TDTD (Controller Gun). There will be four beeps and the display will show:

**XXXX READY**  
**WEAPON NOT READY (READY)**

**2.3.2.6 Time Sync Procedures (PN 148245).**

- a. Have the Controller Time Sync the IWS using the CD/TDTD (Controller Gun). Aim at any detector and pull the trigger. IWS alarm will beep once.

**NOTE**

DO NOT enable the SAT until the alignment process has been properly completed.

Ensure that you use a CD/TDTD (Controller Gun) that has been Time Synchronized by another CD/TDTD (Controller Gun). This ensures that all exercise units and CD/TDTDs (Controller Guns) have the same date and time.

- b. Set the CD/TDTD (Controller Gun) to Clear Events and place the CD/TDTD (Controller Gun) into the IWS Console (DPCU) optical port and pull the trigger.
- c. Using the Arrow push buttons, toggle the display menus until display shows:

**PRESS ENTER TO  
REVIEW EVENTS**

- d. Press ENTER push button on the IWS Console (DPCU) to verify is has been cleared.
- e. Time Sync the IWS again using the CD/TDTD (Controller Gun). Aim at any detector and pull the trigger. IWS alarm will beep once.

### 2.3.2.7 Weapon Enable Procedures (PN 148245)

#### NOTE

Ensure the SAT has been properly installed on the weapon and aligned using the ASAAF prior to performing the following steps.

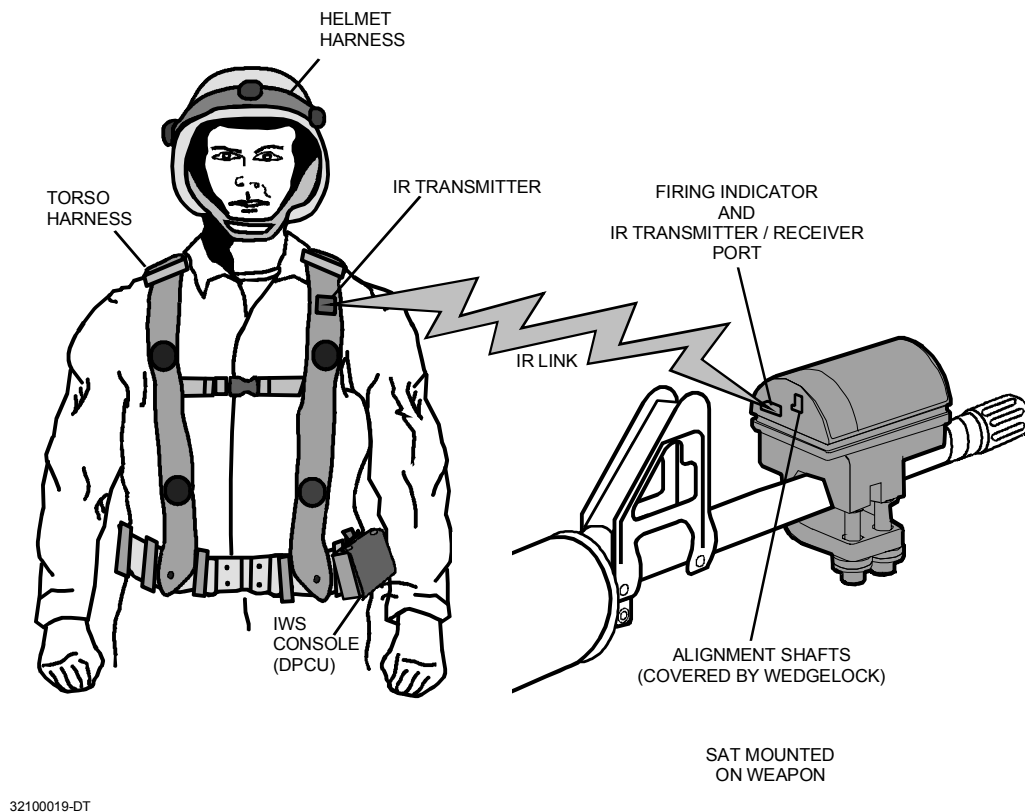
- a. Using the Arrow push buttons, toggle the display menus until display shows:

**PRESS ENTER TO  
TURN WEAPON ON(OFF)**

- b. Press the ENTER push button, display will show:

**POSITION WEAPON TO ENABLE(DISABLE)**

- c. Position the weapon for communication between the Torso Harness IR Transmitter and the SAT (normal firing position). If the procedure is successful, there will be a single beep from the IWS alarm. (See Figure 2-16.)



**Figure 2-16. Enable/Disable the SAT.**

- d. The display will show:

**XXXX READY  
WEAPON READY**

**2.3.2.8 Control Mode Procedures (PN 148245).**

- a. Have the Controller set the IWS Console (DPCU) to Control Mode On using the CD/TDTD (Controller Gun).

- b. The display will show:

**CONTROL MODE ON  
USE ESC TO EXIT**

**NOTE**

Pressing the INFO/ESCAPE (i) push button will turn the Control Mode OFF.

- c. Press the ENTER push button, the display will show:

**S/W VERSION \_ \_ \_ \_**

- d. Press the ENTER push button again, the display will show:

**DEFAULT SET UP  
CUSTOM SET UP**

- e. Using the ARROW push buttons, move the cursor to DEFAULT SET UP and press ENTER.

- f. The display will show:

**DEFAULT – REGULAR  
DEFAULT – FLAK**

- g. Using the ARROW push buttons, select the REGULAR or FLAK setting as directed by the Controller.

- h. Press the ENTER push button, and then press the INFO/ESCAPE (i) push button. This turns the Control Mode OFF and the IWS Console (DPCU) returns to the default screen.

**2.3.2.9 Operations (PN 148245).** The IWS alarm will give audible tones (beeps) to alert the user as to the system status:

- a. One beep – control function being executed.
- b. Two beeps – indicates a Near Miss from incoming fire.
- c. Four beeps – indicates the IWS has been Reset or Resurrected.
- d. Continuous tone – indicates a Kill.

**NOTE**

If a Kill occurs while there is no SAT enabled, the tone will shut off after five seconds. The display will show:

**XXXX KILLED  
WEAPON NOT READY**

If the SAT is enabled when a Kill occurs, the tone will be continuous until the SAT has been located and disabled.

Sniper rifles may go into Sleep Mode prior to firing the first round. Rotate the rifle 90E prior to firing it.

**2.3.2.9.1 Torso Harness Reduction of Internal Battery Drain.** During operation, if the Torso Harness is not processing or receiving data, it will go into one of two modes to reduce internal battery drain.

- a. **Idle.** The Torso enters idle mode (display goes blank) about ten seconds after processing the last switch push, detector or inductive loop input. The Torso comes out of idle (display comes on) when a switch is pushed, or detector or inductive loop activity is detected.
- b. **Sleep.** The Torso will go to sleep about ten hours after processing the last switch push, detector or inductive loop input. The Torso comes out of sleep (display comes on) when movement is sensed by an internal motion switch and any switch is pressed within 30 seconds. The best way to activate the internal motion switch is to slowly rotate the DPCU. The DPCU should be rotated approximately 90 degrees, through the vertical position and then back to its original position.

**2.3.2.10 Postoperation Procedures (PN 148245).**

- a. Disable the SAT:
  - (1) Using the Arrow push buttons, toggle the display menus until display shows:  
**PRESS ENTER TO  
TURN WEAPON OFF**
  - (2) Press the ENTER push button, display will show:  
**POSITION WEAPON TO DISABLE**
  - (3) Position the weapon for communication between the Torso Harness IR Transmitter and the SAT (normal firing position). If the procedure is successful, there will be a single beep from the IWS alarm. (See Figure 2-16.)
  - (4) The display will show :  
**XXXX READY  
WEAPON NOT READY**

## SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

### **2.4 ASSEMBLY AND PREPARATION FOR USE UNDER UNUSUAL CONDITIONS.**

**2.4.1 Unusual Environment/Weather.** MILES 2000 equipment is ruggedized to withstand extreme changes in temperature, terrain, and environment. Therefore, assembly and preparation in unusual environment/weather should only require the caution necessary to ensure the safety of the operators and other participants.

**2.4.2 Fording and Swimming.** MILES 2000 equipment is waterproof and ruggedized. Therefore, equipment transport which requires fording and/or swimming should only require caution necessary to safeguard operators and participants, and to maintain control and accountability of the equipment.

**2.4.3 Emergency Procedures.** MILES 2000 equipment requires no additional procedures for emergency situations, as the equipment has been developed to be used for training simulations encompassing a great variety of conditions and levels of threat.



## SECTION V. FUNCTIONAL CHECKS

### 2.5 FUNCTIONAL TEST PROCEDURES.

The functional check for MILES 2000 equipment is accomplished by the BIT performed by the IWS Console (DPCU). It will run the BIT, and the IWS Console (DPCU) display screen will stay lighted during the test. Once the test has been run, the IWS Console (DPCU) will display the results on the screen. Table 3-1 in Chapter 3, Section I, Troubleshooting, contains the list of possible error messages the IWS Console (DPCU) may display with MILES 2000 equipment.

**2.5.1 Built-In-Test (BIT).** Upon power on, the IWS Console (DPCU) for PN 147421, will perform BIT (Table 2-3). During operation, the BIT can be run by pressing the BIT CTRL FCTN push button (PN 147421 only). There is no power-on BIT for the IWS Console (DPCU) for PN 148245. A commanded BIT can be run by pressing the Enter push button when the “Press Enter to Run BIT” screen is displayed on the IWS Console (DPCU). If there are no problems, the display will indicate “PASS” upon completion of the BIT. Insufficient power will be indicated with the code “LBAT.”

**Table 2-3. Built-In-Test (BIT).**

ACTION	INDICATION
PN 147421: Insert battery in IWS Console (DPCU). This will automatically power up the console.	IWS Console (DPCU) will automatically run the BIT. Display should light and stay lighted throughout the BIT.
PN 148245: Wake up the IWS Console (DPCU). This will activate the internal mercury switch and automatically power up the console.	IWS Console (DPCU) will not automatically run the BIT. Using Arrow push buttons, toggle through screens and select “Press Enter to Run BIT.” Press Enter. IWS Console (DPCU) display should light and stay lighted throughout the BIT.
“SWITCH TEST” will be displayed.	User may now test push buttons on IWS Console (DPCU) to ensure the push buttons are working properly.
Continue to do the switch test until you are satisfied the IWS Console (DPCU) push buttons are working properly.	The display should match the label of the push button being pressed. Arrow push buttons should read “UP” or “DOWN.”
BIT continues after switch test.	
BIT results.	<p>“PASS” indicates IWS is operational.</p> <p>“FAIL” indicates a problem.</p> <p>Refer to Chapter 3, Section I, Table 3-1.</p>

## CHAPTER 3 OPERATOR MAINTENANCE INSTRUCTIONS

### SECTION I. TROUBLESHOOTING

#### 3.1 TROUBLESHOOTING PROCEDURES.

The following are troubleshooting procedures for problems which may be encountered with MILES 2000 IWS operation. Operator troubleshooting procedures involve identifying a problem and isolating the problem to the most likely part of the equipment. Generally the BIT run by the MILES 2000 IWS identifies most problems within the specific IWS component, and produces an error message to let the user know there is a problem. Operator troubleshooting is neither extensive nor difficult. In most cases, the recommended action will be to turn in the defective IWS component for repair, and replace it with a working unit. Table 3-1 lists problems that may be encountered, as well as possible solutions.

You may encounter equipment problems not addressed in this section. If this is the case, notify the appropriate personnel (a supervisor and/or higher echelon maintenance personnel) as soon as possible.

**Table 3-1. MILES 2000 Troubleshooting Chart for IWS Configuration.**

PROBLEM	PROBABLE CAUSE(S)	ACTION
IWS Console (DPCU) display stays blank after battery installed (PN 147421).	Battery contact Failed battery IWS Console (DPCU)	Remove and reinstall battery. Re-run BIT. If problem persists, remove and replace battery. If problem persists, remove and replace Torso Harness.
IWS Console (DPCU) display stays blank after gently shaking and pressing any button (PN 148245).	Internal battery low	Remove and replace Torso Harness.
“LBAT” displayed on IWS Console (DPCU) after BIT.	Batteries low	Replace battery (PN 147241). Remove and replace Torso Harness (PN 148245).
“LBAT” displayed on IWS Console (DPCU) after retest (PN 147421).	IWS Console (DPCU) malfunction	Remove and replace Torso Harness.
IWS Display.	IWS Console (DPCU)	Remove and replace the Torso Harness.
IWS Memory.	IWS Console (DPCU)	Remove and replace the Torso Harness.

**Table 3-1. MILES 2000 Troubleshooting Chart for IWS Configuration-Continued**

<b>PROBLEM</b>	<b>PROBABLE CAUSE(S)</b>	<b>ACTION</b>
IWS Detector/Amp	Detector Amplifier	Remove and replace the Torso Harness.
“BIT FAIL AMP”	IWS Console (DPCU)	Hold IWS Console (DPCU) away from amplifier (PN 147421). Re-run BIT. If problem persists, remove and replace the Torso Harness.
SAT in sleep mode during first round of burst.	SAT	Rotate rifle by 90E to reset.
Note: Detectors will not accept laser fire in the following conditions: 1. BIT FAIL 2. Killed state		

## SECTION II. OPERATOR MAINTENANCE

### **3.2 REMOVAL AND REPLACEMENT.**

In the case of a malfunction of the MILES 2000 equipment, remove the defective equipment per the following instructions, and replace with functional equipment.

#### **NOTE**

Cleaning of MILES 2000 equipment requires no special procedures or the use of cleaning compounds/chemicals. Clean all areas, including the lens area by: (1) wiping dirt and dust away using a soft rag; (2) clean with a soft cloth rag dampened with water; and (3) polish to a brilliant luster with a finishing cloth. **The use of chemicals to clean MILES equipment, including the cleaning of lenses, is not recommended.**

#### **3.2.1 Helmet Harness Assembly Removal and Replacement.**

##### **3.2.1.1 CVC Helmet Harness Assembly Removal and Replacement.**

- a. Gently loosen harness fastener tape from helmet fastener tape.
- b. Remove Helmet Harness from helmet.
- c. Clean the equipment and prepare for turn in.

##### **3.2.1.2 CVC Helmet Harness Assembly Replacement.**

- a. Adjust the harness so the three patches of fastener tape inside line up with the three pieces on the helmet, and that the amplifier is to the rear of the helmet. Press the tape on the harness firmly against the tape on the helmet.

##### **3.2.1.3 Standard Helmet Harness Assembly Removal.**

- a. Detach each fastener strip and route it away from the webbing.
- b. While holding the helmet upright, ensure that fastener strips are not tangled and that they hang freely from the helmet.
- c. Remove the harness from the helmet. Make sure the fastener strips are not tangled.
- d. Clean the harness and prepare for turn in.

##### **3.2.1.4 Standard Helmet Harness Assembly Replacement.**

- a. Ensure that the fastener strips of the Helmet Harness are not tangled.
- b. Place the Helmet Harness over the helmet with the amplifier to the rear of the helmet. Ensure the harness fits snugly just above the helmet brim.

- c. Take each fastener strip and run it inside the helmet, under, around and over the webbing, attaching the part of the strip which is routed over the webbing to the part routed from the outside. Make sure the attachment is secure.

#### **3.2.1.5 Soft Cover Helmet Harness Assembly Removal.**

- a. Unclip and remove the safety pins.
- b. Remove the harness from the cover.
- c. Clean equipment and prepare for turn in.

#### **3.2.1.6 Soft Cover Helmet Harness Assembly Replacement.**

- a. Slip the Helmet Harness over the soft cover with the amplifier to the rear of the cover. Smooth out any wrinkles or twists.
- b. Secure the Helmet Harness to the cover, working from the inside of the cover out and then back in, using the black 3-inch safety pins.
- c. Place the cover on your head and ensure the harness fits snugly. Adjust the harness if it is too snug or too loose via the safety pins.

#### **3.2.2 Torso Harness Assembly Removal.**

- a. Remove the Torso Harness.
- b. Remove the battery from the IWS Console (DPCU), PN 147421 only.

#### **CAUTION**

Ensure battery door/cap is securely closed during storage and operations, or damage can occur to the battery door/cap.

- c. Clean the equipment and prepare for turn in.

#### **3.2.3 Torso Harness Assembly Replacement.**

- a. Put on the Torso Harness.
- b. Power up the IWS Console (DPCU).
  - (1) PN 147421: Install the 9-volt battery in the IWS Console (DPCU).
  - (2) PN 148425: Wake up the IWS Console (DPCU) and press any button.

**3.2.4 SAT Removal.**

- a. Loosen the capscrews, open the clamp, and remove the SAT from the weapon.
- b. Clean the equipment and prepare for turn in.

**3.2.5 SAT Replacement.**

- a. Refer to the appropriate paragraph for the type of weapon being used.

**3.3 IWS DISASSEMBLY PROCEDURES.**

- a. Remove Helmet Harness.
- b. Remove Torso Harness. For PN 147421, remove 9-volt battery from the IWS Console (DPCU).
- c. Clean and inspect equipment. If there is any damage to the IWS equipment, report damage on the appropriate form and turn in with damaged equipment.
- d. Place equipment in transit case.

**TD 23-6920-702-10**  
**TM 6920-10/7**

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